

STANDARD 4 – Wildlife/Threatened and Endangered Species/Fisheries Habitat Health and Weeds

Rangelands are capable of sustaining viable populations and a diversity of native plant and animal species appropriate to the habitat. Habitats that support or could support threatened species, endangered species, species of special concern, or sensitive species will be maintained or enhanced.

Wildlife/Threatened and Endangered Species

1) Characterization

The plant communities/habitat types that occur within this watershed have been described under the Characterization section of Standard 2 (Wetland/Riparian Health) and Standard 3 (Upland Plant Health). These habitat types vary greatly in their ability to support wildlife, depending on species composition, age classes, single-species dominance, horizontal and vertical structure, type abundance, mosaic mix with other habitats, and proximately to features such as migration corridors and winter concentration areas. Over 374 species of wildlife, including birds, mammals, reptiles, and amphibians, are known or expected to occur within the Rawlins Field Office (RFO). [Graph #1](#) lists the number of wildlife vertebrate species by standard habitat types that are found within the RFO and have the potential to be located within this watershed. In general, aquatic habitats support the greatest diversity of species (up to 165) and are the least common types of habitat, comprising about one percent of the landscape. Aspen woodlands are next in terms of supporting the greatest diversity of species, followed by big sagebrush, conifer, mountain shrub, and juniper woodland habitat types. The woodland plant communities are also uncommon in occurrence, comprising about four percent of the landscape. Big sagebrush and sagebrush/mixed grass are the most common plant communities in this watershed. Habitats with the lowest diversity of plants, cover, and structure, such as sand dunes, badlands, and rock outcrops, correspondingly support the lowest number of wildlife species (USDI-BLM, 2002).

The RFO Resource Management Plan (RMP) management objectives for wildlife species are to provide habitat quality (food, cover, space, and water) adequate to support a natural diversity of wildlife and fisheries, including big game, upland game, waterfowl, non-game species, game fish, sensitive, threatened, and endangered species, species of special management interest in Wyoming, as well as to assist in meeting goals of recovery plans. The RMP has an objective to maintain or improve vegetation condition and/or avoid long-term disturbance in high priority standard habitat sites and fisheries areas. In addition, there is an objective to also maintain or improve overall ecological quality, thus providing good wildlife habitat, within the constraints of multiple-use management in moderate and low priority standard habitat sites (USDI-BLM 1990). Although the RMP gives direction to manage the higher priority habitats first, there are circumstances when managing moderate and low priority habitats will take priority. Management of all three of these habitat types to obtain a diversity of vegetative species, cover, age classes, and structure is essential to maintain healthy wildlife populations and their associated habitat types.

The most commonly observed wildlife are big game, particularly antelope and mule deer in open habitat, and elk in shrub and woodland habitat. A small population of bighorn sheep still exists in the Ferris and Seminoe Mountains. Raptors are also very abundant and include golden and bald eagles; ferruginous, red-tailed and Swainson's hawks; burrowing owls; and other hawks, harriers, and owls. Other commonly observed mammals are coyotes, red fox, badger, beaver, muskrat, cottontail and jackrabbits, prairie dogs, ground squirrels, voles and mice. Shorebirds and

waterfowl include great-blue herons, avocet, stilt, phalarope, sandpipers, coots, Canada geese, white pelicans, coots, and various ducks (primarily dabblers). Songbirds vary by habitat type, with sparrows, meadowlark and horned lark most often seen in sagebrush and saltbush areas, and warblers, swallows and flycatcher species observed in riparian habitats. Greater sage-grouse and mountain plover are numerous and important species of interest. Horned lizards and prairie rattlesnakes are the most common reptiles, while tiger salamanders are the most abundant amphibian species ([picture 60-1, 60-2](#)).

Species of Interest or Concern:

There are numerous species of special interest and or concern that inhabit the watershed area, or use parts of the watershed area for migration, transitional zones and/or other corridors. There are five antelope herds, five elk herds, five mule deer herds, and one bighorn sheep herd – all managed by the Wyoming Game and Fish Department (WGFD) - that are located, or are partially located, within this watershed. In addition, other species of special interest and or concern within this watershed include threatened, endangered, candidate, and proposed species (T&E species), BLM-State Sensitive Species, greater sage-grouse and raptors. An account of these are described in the following paragraphs. Crucial winter range for big game species are shown on [Map #6](#). In addition, there is parturition habitat for bighorn sheep located within the Ferris Mountains.

Antelope

Pronghorn antelope are the most visible and numerous form of big game species in the Great Divide Basin ([picture 60-3](#)). Antelope rely heavily on Wyoming big sagebrush habitat, in addition to other ‘open’ communities like saltbush steppe, greasewood, and short grasslands. During the winter, antelope diets consist of primarily Wyoming big sagebrush. However, spring and summer diets include higher amounts of forbs, grasses, and other shrubs. There are five antelope herd units that are located within, or are partially located within, the watershed area. These herd unit areas are identified as the: (1) Baggs Herd Unit; (2) Bitter Creek Herd Unit; (3) Red Desert Herd Unit; (4) South Ferris Herd Unit; and (5) North Ferris Herd Unit.

Baggs Antelope Herd Unit: This herd unit extends from Rawlins southwest to Baggs, with only WGFD Hunt Area 55 lying within this watershed. Hunt Area 55 lies south of I-80 and east of Hwy 789. The majority of this habitat is used from spring through fall, with antelope moving to crucial winter range on Red Rim or further south on Muddy Creek or east on the Iron Springs Unit. Densities of antelope are higher during the summer along Atlantic Rim and Red Rim due to the species composition and production of forbs where higher precipitation occurs.

Bitter Creek Antelope Herd Unit: The Bitter Creek antelope herd unit is bounded by Interstate 80 to the north, the Colorado state line to the south, Highway 789 to the east, and Highway 430 to the west. This herd unit contains WGFD Hunt Areas 57 and 58; whereas only the north ¼ of Hunt Area 57 is located within this watershed. This portion of Hunt Area 57 is classified as winter yearlong habitat for antelope. However, the higher elevations along Highway 789 are used from spring through fall, with lower elevations used on a yearlong basis.

Red Desert Antelope Herd Unit: This herd unit is located northwest from Rawlins, with I-80 the southern boundary the Highway 287 forming the east border. It contains WGFD Areas 60,

61, and 64; whereas the east half of Hunt Area 60 and most of Hunt Area 61 is located within this watershed (WGFD 2002a). The majority of this herd unit is also classified as winter-yearlong habitat. However, summer antelope densities are higher at higher elevations where forb diversity and production is greater. Antelope congregate at lower elevations during the winter, particularly south and east of Bairoil, along Separation Creek, the Chain Lakes and Horseshoe Bend. An extensive research project was conducted in this area in the early 1980s. During the severe winter of 1983-84, antelope moved as far west as Green River and north to the Sweetwater River.

South Ferris Antelope Herd Unit: This herd unit lies northeast of Rawlins and is bordered by I-80 on the south, Highway 287 on the west, the Ferris and Seminole Mountains on the north, and the North Platte River on the east. It contains WGFD Hunt Area 62, and all but the southeast corner is contained within this watershed. Crucial winter range is located at lower elevations along Highway 287 and Seminole Reservoir, and along the windswept rims of the Rawlins uplift. The majority of this unit is used from spring through fall, with winter use dictated by annual climate conditions.

North Ferris Antelope Herd Unit: This herd unit is located north of the Ferris and Seminole Mountains and south of Highway 220. It contains WGFD Hunt Area 63, with most of this hunt area within the watershed. This herd unit contains crucial winter range at lower elevations along Highway 220 and Pathfinder Reservoir, and the majority of the habitat used from spring through fall.

Elk

Elk are the largest of the big game wildlife species that are common in this watershed. Elk normally prefer staying close to hiding cover, so are most often associated with conifer and aspen woodlands or tall shrublands. These are found on Atlantic Rim and the Ferris and Seminole Mountains ([picture 61-1](#)). However, elk have also become established in the tall sagebrush habitats on the Rawlins Uplift and the Continental Divide north of Creston. They prefer grasses and have a high diet overlap with cattle, but will include more forbs in their spring diets and more shrubs in their winter diets. There are three elk herd units that are located within, or are primarily located within, the watershed area. These herd unit areas are identified as the: (1) Ferris Herd Unit; (2) Shamrock Herd Unit; and (3) Sierra Madre Herd Unit.

Ferris Elk Herd Unit: This herd unit is located on and adjacent to the Ferris and Seminole Mountains. It contains WGFD Hunt Areas 22 and 111. Elk avoid areas with human activity and stay close to hiding cover, and therefore, are primarily found on the mountains or along shrub and woodland dominated riparian habitat in the summer and fall. They generally move off the mountains during the winter to sites where adequate forage is available and/or where topography provides visible and thermal protection.

Shamrock Elk Herd Unit: This herd unit lies north of I-80 and from north of Rawlins westward to nearly Wamsutter. It contains WGFD Hunt Area 118. The elk move within this area based on forage availability and human activity, but do not have a defined crucial winter range.

Sierra Madre Elk Herd Unit: This herd unit includes the forest and rangelands south of Rawlins and between Saratoga and Baggs. It is comprised of the WGFD Hunt Areas 13, 14, 15, 21, and 108, of which only half of Hunt Areas 108 is located within this watershed. This unit includes Atlantic Rim and Miller Hill, where smaller numbers of elk (200-300) live year-round, augmented by elk from the National Forest which move to lower elevations during the winter.

Numbers of elk using the area around Atlantic Rim have increased significantly in the last few years, which may in part be due to the prescribed burns that have increased the herbaceous component for that area. In March of 2003, over 1600 wintering elk were seen in the sagebrush flats just west of Atlantic Rim.

Mule Deer

Mule deer are the second most abundant big game species following antelope in this watershed. However, mule deer are not found evenly distributed across the landscape. They prefer areas with hiding cover and higher precipitation sites with forbs, which tend to occur close to the mountains, rims, and along stream drainages and lakes. Mule deer select forbs and grasses when green and more nutritious, shifting to primarily shrubs in the fall and winter. Compared to antelope, mule deer prefer a mixture of sagebrush and other shrubs during the winter. There are three mule deer herd units that are located within, or are partially located within, the watershed area. These herd unit areas are identified as the: (1) Ferris Herd Unit; (2) Chain Lakes Herd Unit; and (3) Baggs Herd Unit.

Ferris Mule Deer Herd Unit: This herd unit lies northeast of Rawlins, bordered by I-80 on the south and Highways 287-220 on the west and north. It is comprised of the WGFD Hunt Area 87, all of which except the northern tip, is located within this watershed (WGFD 2002a). Mule deer primarily spend spring through fall on or near the mountains and uplifts and near shrub and woodland riparian habitats. Crucial winter ranges are found at mid and lower elevations where mixtures of sagebrush and mountain shrubs provide the desired/available forage.

Chain Lakes Mule Deer Herd Unit: This herd unit is located northwest of Rawlins with I-80 forming the south border and Highway 287 forming the east border. It is comprised of the WGFD Hunt Areas 98, of which the entire hunt area is located within this watershed. This herd unit contains a small population of mule deer found in marginal habitats in the eastern portion of the Great Divide Basin. They primarily use the rougher topography found on the Rawlins Uplift and Lost Soldier Rim. A significant portion of the herd resides in or near Rawlins, Wyoming (Picture 62-1)(WGFD 2002a).

Baggs Mule Deer Herd Unit: This herd unit includes that portion of the watershed located south of I-80. The herd unit is comprised of the WGFD Hunt Areas 82, 84, and 100, of which half of Hunt Area 84 and only the northeast corner of Hunt Area 100 are located within this watershed. The principle mule deer population lives in and adjacent to the rougher topography found along Atlantic, Red, and Delaney Rims. These areas contain more desirable mixtures of shrubs, forbs, and grasses. Small populations of deer are also found in the denser sagebrush habitats between Atlantic Rim and Echo Springs.

Bighorn Sheep

Ferris-Seminole Bighorn Sheep Herd Unit: There are a handful of bighorn sheep that reside within the Ferris-Seminole ecosystem (picture 62-2). These sheep have been known to cross landscapes between the Seminole Mountains and may travel west from the Ferris Mountains into the Green Mountains. Sheep use habitat types that include mountain meadows, rocky outcrops, and riparian habitats located within the Ferris and Seminole Mountains. They prefer grasses and forbs over shrubs, resulting in dietary overlap concerns with both cattle and elk depending on the location.

Raptors

There are several raptor species that have been observed within the watershed area, or their nests have been identified within the area. Raptors that have known nests within the area include the ferruginous hawk, golden eagle ([picture 63-1](#)), Swainson's hawk, great-horned owl, Cooper's hawk, prairie falcon, red-tailed hawk, burrowing owl, northern harrier, and kestrel. Although nests have not been identified for the northern goshawk, long-eared owl, short-eared owl, and sharp-shinned hawk, these species have the potential to nest within this watershed. The ferruginous hawk, burrowing owl, and northern goshawk have been identified as BLM-State Sensitive Species and are discussed in that section of the document as well.

Hawks

The sharp-shinned hawk summers in mixed deciduous and coniferous woods and winters in woods and near bird feeders. These hawks feed by catching small birds in midair and carrying them off to eat. They may hunt among bird feeders. The Cooper's hawk inhabits mixed forests and open woodlands. This hawk has regular feeding routes during the breeding season where it hunts for common medium-sized birds such as mourning doves, jays, and starlings. The northern goshawk inhabits deep woods with mostly conifers. These hawks feed on birds by catching them in the air, and feed on mammals by swooping down on them. They eat medium size birds and mammals such as grouse and squirrels. The Swainson's hawk inhabits prairies and open arid land. This hawk often feeds by hopping on the ground, eating insects such as grasshoppers and crickets. They soar and catch mice, rabbits, lizards, frogs, and birds. The red-tailed hawk inhabits a variety of open habitats. This hawk may perch, hover, or hold still into the wind when hunting. This hawk eats small mammals, birds, and reptiles. The ferruginous hawk inhabits arid open land and grasslands. This hawk feeds by swooping down on prey from the air. They eat mostly medium-sized mammals, reptiles, and insects.

Owls

The great-horned owl inhabits extremely varied areas including woods, deserts, and suburbs. This large fearsome hunter will capture a wide variety of prey, ranging from insects to prey the size of a great blue heron. They eat squirrels, mice, rabbits, snakes, skunks, weasels, porcupines, domestic cats, crows, ospreys, as well as other owls and hawks, including barred owls and red-tailed hawks. The burrowing owl inhabits open plains, grasslands, and desert scrub. These owls eat insects, scorpions, crayfish, mice, ground squirrels, young prairie dogs, rabbits, amphibians, snakes, and rarely birds. The long-eared owl inhabits woods and willow patches near open fields and marshes. This owl eats mostly voles and mice, but have been known to eat amphibians, reptiles, and insects. The short-eared owl inhabits open fields, marshes, dunes, and grasslands. This owl feeds mostly on voles, but will also hunt songbirds and some game birds. They hunt mainly at dawn and dusk.

Other Raptors

The golden eagle inhabits mountains, foothills, and adjacent grasslands. This bird hunts by soaring and then diving down on prey such as rabbits and rodents and some birds, and they also feed on road-killed animals as well. The prairie falcon inhabits the plains, grasslands, and other open country. This raptor catches birds in midair or on the ground, and mammals after a swift swoop. The northern harrier inhabits open fields, grasslands, prairies, and marshes. This raptor feeds by coursing close to the ground and quickly swooping down on its prey. They eat mice, rats, birds, snakes, frogs, and other small mammals. The kestrel inhabits a wide variety of open

habitats, including urban areas. This raptor hunts by perching or hovering, then diving to catch prey. They eat voles, mice, birds, and insects (Stokes 1996).

Threatened, Endangered, Proposed, and Candidate Species:

There are seven threatened, endangered, proposed, and candidate species (T&E species) that occur, or have the potential to occur, within the watershed, and six species – the North Platte River species – that do not physically occur within this watershed, but that may be affected by actions that occur within the watershed. These include the bald eagle, black-footed ferret, blowout penstemon, Canada lynx, North Platte River species (least tern, pallid sturgeon, piping plover, whooping crane, Eskimo curlew, and western prairie fringed orchid) mountain plover, Ute ladies' tresses, and Western boreal toad. T&E species that are located within the RFO, but that do not occur, or do not have the potential to occur and/or are not affected by actions within this watershed include the Colorado butterfly plant, Colorado River species (bonytail chub, Colorado pike-minnow, humpback chub, and razorback sucker) Preble's meadow jumping mouse, Wyoming toad, and yellow-billed cuckoo.

Bald Eagle

The current status of the bald eagle is threatened. Bald eagles are found in conifer, cottonwood-riparian, and river ecosystems and forage in adjacent upland rangelands (USDI-BLM 2002). There are known bald eagle nests located along the North Platte River drainage within both the RFO and the Casper Field Office (CFO). There is winter habitat located to the northeast of the watershed, along the North Platte River, in the CFO, just northeast of the Rawlins-Casper Field office lines.

Black-footed Ferret

The black-footed ferret is considered endangered and is the rarest and most endangered mammal in North America and receives full protection under the Endangered Species Act of 1973 (Act). This species lives in prairie dog towns and relies on prairie dogs for both food and shelter. The original range of the black-footed ferret corresponded closely with the prairie dog, extending over the Great Plains area from southern Canada to the west-Texas plains and from east of the 100th Meridian to Utah and Arizona (USDI-BLM 2002).

Blowout Penstemon

The blowout penstemon is considered an endangered species and receives full protection under the ESA of 1973. This plant is located in areas of sparsely vegetated shifting sand dunes or wind carved depressions (blowouts). Formerly only known to exist in Nebraska, it was discovered in the sand dunes on the south side of Bear Mountain in this watershed in 1996. The habitat it occupies is on sandy aprons or the lower half of steep sandy slopes deposited at the base of granitic or sedimentary mountains or ridges (USDI-BLM 2002).

Canada Lynx

The current status of the Canada lynx is threatened. Lynx occur in the boreal, sub-boreal, and western montane-forests of North America. Snowshoe hares are the primary food source of lynx, comprising 35-97 percent of their diet throughout the range. Other prey species include red

squirrels, ground squirrels, mice, voles, porcupine, beaver, and ungulates as carrion or occasionally as prey. Lynx prefer to move through continuous forests and use ridges, saddles and riparian areas. Lynx have been known to cross large rivers and lakes and have been documented in habitats such as shrub-steppe, juniper, and ponderosa pine (USDI-FWS, 1999a).

Mountain Plover

The U.S. Fish and Wildlife Service (Service) proposed listing the mountain plover as threatened in February 1999, without critical habitat, under the authority of the ESA of 1973. The mountain plover is a bird of short-grass prairie and shrub-steppe landscapes at both breeding and wintering locales. The birds winter in southern California. This species has declined by 2.7 percent annually from 1966 through 1996, the highest of all endemic species. Mountain plovers are rarely found near water and use both native rangelands and disturbed areas for nesting and for brood-rearing (USDI-BLM 2002).

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid

The North Platte River species include the endangered Eskimo curlew, interior least tern, pallid sturgeon, whooping crane and the threatened piping plover, bald eagle, and Western prairie fringed orchid. The first five species are downstream residents of the Platte River, the whooping crane is a migrant along the central Platte River in Nebraska, and the bald eagle is a downstream winter resident of the Platte River (FWS July 2001). The bald eagle is also a winter resident of the North Platte River in the Casper Field office to the north-east of the watershed area and has the potential to nest along the North Platte River.

Ute Ladies' Tresses

The Ute ladies' tresses is considered a threatened species under the ESA of 1973. This plant is a perennial, terrestrial orchid. This plant blooms from late July through August; however, depending on location and climatic conditions, orchids may bloom in early July or still be in flower as late as early October. This orchid is endemic to moist soils in mesic or wet meadows near springs, lakes, seeps, and riparian areas within the 100-year flood plain of perennial streams ranging from 4,300-7,000 feet in elevation. It colonizes early successional riparian habitats such as point bars, sand bars, and low laying gravelly, sandy, or cobbly edges, persisting in those areas where the hydrology provides continual dampness in the root zone through the growing season (USDI-BLM 2002).

Western Boreal Toad

The Western boreal toad (boreal toad) is a candidate species under the ESA of 1973. This species is found in riparian areas above 7,500 feet in elevation adjacent to and within the Medicine Bow National Forest (USDI-BLM 2002).

BLM State Sensitive Species:

Many wildlife and plant species are experiencing population declines. The BLM developed a sensitive species list to better manage species and their habitats. There are 26 BLM-state sensitive species that have the potential to occur within this watershed. These species include

seven mammals, twelve birds, three amphibians, and four plants. The BLM state sensitive fish, reptiles, and amphibians that may occur within this watershed are discussed in the Fisheries section. The BLM state sensitive mammals that have the potential to occur in this watershed, or that may migrate and/or travel through the watershed area, include the dwarf shrew, long-eared myotis, fringed myotis, spotted bat, Townsend's big-eared bat, white-tailed prairie dog, Wyoming pocket gopher, Idaho pocket gopher, and swift fox. The BLM state sensitive birds that have the potential to use this area include the white-faced ibis, northern goshawk, ferruginous hawk, peregrine falcon, greater sage-grouse, long-billed curlew, burrowing owl, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and Baird's sparrow. The BLM state sensitive plants that may occur in this watershed, or have the potential to occur in the watershed include the Nelson's milkvetch, cedar rim thistle, persistent sepal yellowcress, and pale blue-eyed grass. With the exception of persistent sepal yellowcress, there have not been any identified populations at this time. However, there is the possibility that these plants may occur in the area. A description of the habitat type that each species is associated with is shown in [Graph 1](#).

Table 3 : BLM State Sensitive Species That May Occur In The Watershed

<i>Mammals</i>		
Common Name	Scientific Name	Habitat Types
Dwarf shrew	<i>Sorex nanus</i>	Mountain-foothill shrub, grasslands
Long-eared myotis	<i>Myotis evotis</i>	Conifer and deciduous forests, caves and mines
Fringed myotis	<i>Myotis thysanodes</i>	Conifer forest, woodland, caves and mines
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	Forests, basin-prairie shrub, caves and mines
White-tailed prairie dog	<i>Cynomys leucurus</i>	Basin-prairie shrub, grasslands
Wyoming pocket gopher	<i>Thomomys clusius</i>	Meadows with loose soil
Swift fox	<i>Vulpes velox</i>	Grasslands
<i>Birds</i>		
Common Name	Scientific Name	Habitat Types
White-faced ibis	<i>Plegadis chihi</i>	Marshes, wet meadows
Northern goshawk	<i>Accipiter gentilis</i>	Conifer and deciduous forests
Ferruginous hawk	<i>Buteo regalis</i>	Basin-prairie shrub, grassland, rock outcrops
Peregrine falcon	<i>Falco peregrinus</i>	Tall cliffs
Greater sage-grouse	<i>Centrocercus urophasianus</i>	Basin-prairie shrub, mountain-foothill shrub
Long-billed curlew	<i>Numenius americanus</i>	Grasslands, plains, foothills, wet meadows
Burrowing owl	<i>Athene cunicularia</i>	Grasslands, basin-prairie shrub
Sage thrasher	<i>Oreoscoptes montanus</i>	Basin-prairie shrub, mountain-foothill shrub
Loggerhead shrike	<i>Lanius ludovicianus</i>	Basin-prairie shrub, mountain-foothill shrub
Brewer's sparrow	<i>Spizella breweri</i>	Basin-prairie shrub
Sage sparrow	<i>Amphispiza billineata</i>	Basin-prairie shrub, mountain-foothill shrub
Baird's sparrow	<i>Ammodramus bairdii</i>	Grasslands, weedy fields
<i>Amphibians</i>		
Northern leopard frog	<i>Rana pipiens</i>	Beaver ponds, permanent water in plains and foothills
Great basin spadefoot	<i>Spea intermontana</i>	Spring seeps, permanent and temporary waters
Boreal toad	<i>Bufo boreas boreas</i>	Pond margins, wet meadows, riparian areas
<i>Plants</i>		
Common Name	Scientific Name	Habitat Types
Nelson's milkvetch	<i>Astragalus nelsonianus</i> – or- <i>Astragalus pectinatus</i> var. <i>platyphyllus</i>	Alkaline clay flats, shale bluffs and gullies, pebbly slopes, and volcanic cinders in sparsely vegetated sagebrush, juniper, cushion plant communities at 5200'-7600'
Cedar rim thistle	<i>Cirsium aridum</i>	Barren, chalky hills, gravelly slopes, & fine textured, sandy-shaley draws at 6,700'-7,200'
Persistent sepal yellowcress	<i>Rorippa calycina</i>	Riverbanks & shorelines, sandy soils near high water line
Pale blue-eyed grass	<i>Sisyrinchium pallidum</i>	Wet meadows, stream banks, roadside ditches, & irrigated meadows at 7,000-7,900'

The objective of the sensitive species designation is to ensure that the BLM considers the overall welfare of these species when undertaking actions on public lands, and do not contribute to the need to list the species under the provisions of the ESA. The lack of demographic, distribution, and habitat requirement information compounds the difficulty of taking management actions for many of these species. It is the intent of the sensitive species policy to emphasize the inventory, planning consideration, management implementation, monitoring, and information exchange for the sensitive species on the list in light of the statutory and administrative priorities (USDI-BLM 2001).

Greater Sage-Grouse

Greater sage-grouse (grouse) are common inhabitants within this watershed ([picture 67-1, 67-2](#)). Grouse populations have exhibited long-term declines throughout North America, with a 33% decline over the past 30 to 40 years. No one causal factor has been identified for these declines. Wyoming supports the largest populations of grouse, more than all the other states combined; however, there are population declines occurring in Wyoming as well. Grouse are a sagebrush obligate species and each aspect of their life cycle requires slightly different elements within the sagebrush communities. Grass height and cover play an important role in the nesting success of grouse. Early brood rearing habitats contain relatively open stands of sagebrush with greater than 15 percent canopy cover of grasses and forbs, and contains insects as well. During the summer months, grouse move to more mesic sites seeking succulent forbs. Movements to winter ranges are slow and meandering and occur from late August to December. During the winter months, grouse feed almost exclusively on sagebrush leaves (USDI-BLM 2002).

Winter habitat has been identified for parts of this watershed and will be finalized using GIS. Only certain areas were flown for winter habitat within this watershed for different projects; therefore, there is always the possibility that additional winter habitat areas for greater sage-grouse will be identified in other areas of the watershed unit. Winter habitat must be assessed during very specific time periods and under specific winter conditions.

2) Issues and Key Questions

There are several issues and key questions that have been identified for wildlife species. The major issues that concern wildlife species include the overall health of the ecosystem including both the quality and quantity of a diversity of habitat types that species depend on throughout their life cycles; the availability of these habitat types for wildlife species; and existing and potential disturbance of these habitat types to wildlife species. Priority wildlife habitats include riparian grassland, willow-waterbirch riparian, aspen and cottonwood woodlands, and wet forested meadow areas; in addition to open aquatic; sagebrush-grass communities, mountain shrub, saltbush steppe, conifer forest, and rockland areas (USDI-BLM 1990). Habitat diversity includes vegetation cover types and age distribution, as well as the need for disturbance-such as fire, disease, and/or climatic change. Factors that affect the availability of these habitat types for wildlife include livestock management, oil and gas development, and inter- and intra-species competition for available forage and associated diet overlap. Existing and potential disturbances to wildlife species include impacts to priority habitats from fencing, water development projects, vegetative treatments, and livestock/wild horse use; disturbance to individual life cycles from human activity, including oil and gas development and associated facilities - such as pipelines, utility corridors, roads, recreation activities, OHV use, and noise. The following describes issues and key questions that pertain to specific wildlife and impacts that may occur as a result of activities occurring.

Species of Interest and Concern

Antelope

Issues that relate to antelope across the watershed include fence impacts upon animal movement, and other livestock management practices relating to water developments and type/season of use by livestock. These will be discussed for all herd areas at one time. Issues that affect antelope which are more specific to particular herd areas (and will be discussed by herd area) include oil and gas development, vegetation treatments, wild horses, and the development of private land within checkerboard areas.

There are over 1,000 miles of fencing in the assessment area, most of which were constructed prior to standards being created to reduce impacts on wildlife. Since the predominant livestock use in this area was by sheep, approximately half of old style fences are woven wire with one or two strands of barbed wire on top. Antelope prefer to pass under or through a fence, however adult animals will jump over them at times. Woven wire fences prevent passage under or through them, forcing antelope (particularly young) to find low spots such as gully crossings where they can get under the fence. During severe winter conditions, antelope have to expend additional time and energy to get through fences while migrating which may reduce their chance for survival, or they may get stuck in fence corners where they are likely to die. During the 1983-1984 severe winter, almost all dead antelope immediately north of Interstate-80 were found within allotments where fences were constructed of woven-wire (Alldredge and Deblinger, 1988). Old fences built to control cattle were made with four to six strands of barbed wire. Although the bottom strands are lower than the height recommended in BLMs fencing standards, antelope can often pass through these fences or find low spots to go underneath them. Modifications need to be made to sheep style (woven wire) fences in particular to reduce the impacts to antelope migrating between spring/summer/fall and winter ranges ([pictures 68-1, 68-2](#)). Although a few spots have been modified to BLM fencing standards to assist antelope in moving through fences, much more needs to be done. In some cases, just installing gates in corners that would be left open during the winter would help a lot. Since not all of this work can be done at once, what locations should have the highest priority to be modified initially and in future years? How can we accomplish the modification of a significant amount of fence each year to resolve this issue in a reasonable amount of time?

Livestock management practices primarily relate to water, both in terms of new developments and their management, as well as protection of natural seeps and streams. When new water sources are developed, which are usually for summer cattle use, antelope and other wildlife will use them and depend upon them, especially during times of drought. However, if these water developments are wells, they may be turned off or the generator moved to a different location when the cattle are moved and the wildlife must look for water elsewhere. There have been incidents where antelope get stuck in certain pastures due to woven wire fences and can't move to new locations when the water they were using is no longer available. How can these situations be avoided? Are there certain times or locations when water should remain available, either through continuing to pump water or development of other sources? In other situations, water developments have been created for wildlife, such as guzzlers or other projects. These are often developed and maintained by individuals working for state or federal agencies, which often are not taken care of when these individuals retire or move to other jobs. How can this situation be rectified to maintain the use of these facilities for the long-term benefit of antelope and other wildlife? About 90% of all livestock use is made by cattle, which have a low overlap in diet similarities with antelope. However, cattle can have a significant impact on riparian habitat that is important to antelope. Through the use of riparian pastures or exclosures, these areas are

managed or protected from a livestock perspective, but from a wildlife viewpoint, what mix of vegetative species and structure should be promoted and what form of management will it take to achieve this?

Baggs Antelope Herd Unit: Coalbed methane development is proposed in the area from Atlantic Rim just south of Rawlins to Muddy Mountain just north of Baggs and Dixon, Wyoming. Initial efforts consist of 200 exploratory wells to gather information, with full field development reaching as many as 2,000 wells. In addition to the wells, ancillary facilities will include compressor stations, service roads, and pipelines which may affect antelope. Although the majority of this development would occur outside crucial winter ranges, these adjoining lands which are often referred to as transitional range, are very important in supporting animal use and taking pressure off of the crucial winter range. What affects will coalbed methane development have on antelope transitional ranges and what long-term indirect affects will occur to antelope crucial winter range?

There has been approximately 6,000-7,000 acres of prescribed burns that have occurred in the Fillmore allotment over the past ten years and 2,200 acres of chemical (tebuthiuron) thinning of sagebrush as well. Additional vegetative treatments in this allotment and adjoining allotments are being planned. The principle plant community being affected by prescribed burns have been mature to decadent stands of basin big sagebrush, with smaller areas of mountain and Wyoming big sagebrush, aspen and mountain shrubs. Chemical treatments are directed primarily at stands of Wyoming big sagebrush which have lower fuels to support burning and in an attempt to reduce the affect upon greater sage-grouse by thinning rather than removing all of the sagebrush. A ten year cooperative research study between the BLM and the WGFD on the nearby Grizzly allotment is almost completed that compares the impacts of both prescribed burning and chemical applications to sagebrush communities and the wildlife that use them. However, all shrub treatments should be monitored as closely as possible to document the change in habitat conditions and effect on antelope and other wildlife species. What are the cumulative impacts to antelope as a result of implementing vegetative treatments in addition to coal bed methane and natural gas development in these areas?

Bitter Creek Antelope Herd Unit: Deep gas well drilling continues to expand throughout the herd unit. In the Echo Springs area the spacing of gas wells is changing from 160 acre spacing down to 80 acre spacing, with increased disturbance due to roads, pads, pipelines and other facilities. Seismic projects are also occurring within the herd unit. These projects reduce the habitat available and cause temporary displacement of animals and may create disturbance within the herd unit. The road networks also increase the use of this area by recreationists and other people. Gas field development has led to additional water sources being created which change the distribution and seasonal use patterns of antelope in this area. In many cases the affect of these water sources may be beneficial, however, are antelope now staying longer in these areas and what impacts are there on the rangeland as a result? And what are the cumulative impacts to antelope as a result of the expanding natural gas development within this herd unit area?

Red Desert Antelope Herd Unit: A survey completed in 2001 found large numbers of antelope north of traditional winter range in Area 60, and it may be necessary to modify the crucial winter range boundaries in this area. Habitat losses have occurred due to oil and gas development. Increased drilling and development of hundreds of natural gas wells in the southwestern third of the herd unit could impact crucial winter habitat. Major portions of the southern part of this herd unit are underlain by coal seams that have the potential to be developed for coalbed methane. Impacts from the Amoco CO2 injection project in Bairoil, Wyoming in the crucial winter range

have been localized in already disturbed habitats and do not appear to have a significant impact. A proposal to haul ore from an underground uranium mine on the south side of Green Mountain to the inactive Union 76 mill would have a minor affect on antelope summer habitat, but could negatively affect antelope migrations if not properly mitigated. What are the impacts on this herd from natural gas development and associated roads, pipelines, and reserve pits? What effects will occur if and when coalbed methane development occurs within this watershed?

Nearly 100,000 acres of private land in the checkerboard area north and west of Rawlins has been sold in forty acre tracts, primarily to out of state owners who want to “own a piece of the West”. Although development of these lands is slow, portions of crucial winter range are being affected as buildings and fences are constructed, access to water is changed, and domestic animals and pets are brought in to native environments. Increased development of these lands, particularly as more fencing is constructed, could seriously degrade the quality and utility of antelope crucial winter range, and can impact migration corridors. While Carbon County does have a land use plan, which promotes maintaining open range and habitat for wildlife, the other neighboring counties have no similar plans and the rights of private landowners to do as they please with their lands creates a real dilemma for public land managers in these checkerboard areas. How much further development will occur in the future and what types of mitigation, if any, will be effective and pursued? Could land exchanges or other methods be supported to block up private lands for development that would maintain open spaces on public lands and protect crucial wildlife habitats?

There is some concern with the wild horse management, including population levels, their impact on riparian habitat, and indirect competition between wild horses and antelope. Prior to 2001 wild horse populations had been two to three times higher than the appropriate management level (AML). The principle concern has been with the wild horse use and competition around scarce water sources and the condition of riparian habitat and wetlands that are important in supporting antelope does and fawns. Will wild horse populations be maintained at the AML? Is this AML the right number of wild horses to manage for in conjunction with wildlife, livestock use, and other resource values? What management changes will be made to reduce existing conflicts between antelope and wild horses?

South Ferris Antelope Herd Unit: The CBM development on the west side of Seminole Reservoir will affect antelope through the loss of habitat due to road, well pad, facility, and pipeline construction in the eastern portion of this herd unit. Full development of methane wells along the coal beds could have serious impacts on crucial winter ranges from both habitat loss and disturbance. When development occurs, AUMs are removed for both wildlife and livestock, which could result in additional inter-specific competition. What short and long-term impacts will CBM development have on antelope herds within this unit area?

A conversion from sheep to cattle on the Stone Ranch should reduce forage competition for antelope on a year-round basis, and particularly during winter months. Without the need for woven wire fencing, modifications in key locations initially and across a large part of the ranch long-term will remove barriers to antelope movement and increase animal survival. Best management practices for cattle use will be implemented, but what vegetative objectives should be incorporated into the grazing plan that would most benefit wildlife?

North Ferris Antelope Herd Unit: This herd unit is primarily influenced by fencing and livestock management issues that are discussed under the general heading of antelope.

Elk

The major issues affecting elk are fence impacts on animal movement, competition with cattle for forage, reduced health and productivity of forest and shrublands due to the lack of natural fire, and increased human activities and disturbance to elk from oil and gas development and recreation. Fencing and competition with cattle are issues common to all three herd units and are discussed together. Topics of concern that are not common to all herd units are discussed for each individual herd unit.

Elk movement is affected by fences, and vice versa, much differently than with antelope. Elk, being considerably larger, will generally jump over fences. However, young elk will have to pass under or through fences for a time and can get stuck behind a fence they can't get through or get a leg caught while attempting to jump a fence. Woven wire fences constructed for sheep present problems for very young elk, but these fences were usually not over 40 inches tall and can be jumped over fairly easily. Old style fences built for cattle may be 50 to 55 inches tall and present considerable problems for both young and adult elk. Elk which summer on the national forest or the Ferris and Seminoe Mountains may not have many fences to pass over until they migrate in the spring and fall to and from the winter range. The Shamrock elk herd stays in sagebrush habitat year-round in country with more fences, but does not migrate or move around typically as far as the other two elk herds. Fence locations requiring annual maintenance due to big game movement are good indicators of where fence modifications should occur to reduce both the cost of maintenance and the impact to big game species. How can a program be implemented to modify fences where needed in the short-term, and correct all fences to meet BLM standards in the long-term?

Competition for forage between elk and cattle occurs to some degree. The percent diet overlap is around 80% for these two species. The fact that all three elk herds are above herd population objectives would indicate that current levels of livestock use is not affecting elk numbers. In terms of there being available forage for use by both types of animals, this is probably true, but distribution of livestock use will affect where forage is left and where elk have to move in order to find forage. Two cases of this happening are the Ferris elk herd using the Beef Acre area as well as private hay meadows and the Baggs elk herd using the Fillmore Creek drainage and Red Rim area. Water development and improved riparian and upland range conditions are also affecting elk distribution and how long they stay in a particular area. Should more attention be paid to these changes in elk distribution and use patterns, and how does this reflect back on the management of cattle or other activities in these areas?

Ferris Elk Herd Unit: The health of shrub and woodland communities on the Ferris and Seminoe Mountains is a key issue affecting the Ferris elk herd. Due to wildfire suppression and the lack of prescribed burns, there is increasing decadence, disease, insect infestations, and dominance by late successional species in these communities. They provide important cover as well as forage for elk and a large wildfire could have serious affects upon this elk herd. However, change is needed to provide elk and other wildlife with the diverse and productive habitat to support them. A plan to address these issues has been "in the works" for the past ten years, but is still not completed. What steps need to be taken, what support is needed, in order to restore healthy and diverse shrub and woodland communities in this herd unit?

Shamrock Elk Herd Unit: Conventional natural gas development has occurred for many years on the west side of this herd unit, and is expanding around Wamsutter and east to the Continental Divide. Elk have been using the undeveloped Five-mile Draw area, but development is occurring

here as well. Elk use areas with lower road density and human activity, and rapid increases in road densities are reducing the size of elk security areas. Elk may permanently migrate west out of this area. Although coalbed methane development has not occurred in the area, there are shallow coal seams that underlie much of the elk habitat. This area overlaps the portion of the Red Desert Antelope Herd Unit where development of private lands within the checkerboard area is increasing. With nearly 100,000 acres of private lands sold this will eventually affect elk using this area. Results will likely include an increase in density of roads, buildings, fences and human activity. What will be the cumulative affects on elk herds from natural gas development and will these affects decrease after full field development occurs? What future impacts will occur to elk as development of private lands occurs? What value will the intermingled sections of public land still retain as wildlife habitat?

Sierra Madre Elk Herd Unit: Coalbed methane is in the initial stages of development on the west side of Atlantic Rim. Compressor stations, service roads, and pipelines associated with this development will increase access and may create disturbance to wildlife. Elk, of all of the big game species, have the lowest tolerance for disturbance and studies show them staying a mile or more away from roads with frequent human activity. The level of disturbance to elk will depend on the number of wells developed, their location and associated roads. Winter and transitional ranges may be affected, since in the past most of this area is inaccessible due to drifting snow. The west side of this herd unit along highway 789 is also experiencing increased development for natural gas. The roads associated with this development increase the human presence in these areas, both by the commercial industry and by recreationists throughout the year. What will be the cumulative affect of developing coalbed methane and conventional natural gas resources on elk within this herd unit? What mitigative measures can be implemented up front that will reduce the affect of this development upon this elk herd?

Mule Deer

The issues that relate to mule deer include fence impacts on animal movement, livestock management practices, health of shrub and woodland habitats, natural gas and coalbed methane field activities, and development of private lands in the checkerboard area. The affect of fences upon mule deer are similar to those described for elk. Mule deer will typically jump over fences, with concerns relating to fence height and the spacing of the top two wires. Young deer may have to pass under or through fences, so that woven wire fences raise the greatest concerns. The affect of development of natural gas resources and private lands are similar to those described for antelope.

Livestock management practices that have the greatest effect on mule deer are fencing (already discussed), type of livestock use (cattle versus sheep), and management impacts to mule deer habitat, particularly riparian plant communities. Sheep diets are very similar to mule deer and antelope, so competition for forage can be an important factor. However, current use levels by sheep only make up ten percent of all livestock use, compared to the inverse of that 100 years ago. Use by cattle and mule deer primarily overlap in riparian habitat. Spring through fall use of riparian habitat by cattle has degraded the value of these sites for mule deer use, especially the woody plants which are important as forage and cover. Use of best management practices for cattle has improved many of these areas. However, how can these BMPs become the standard operating procedure so that these kind of issues are no longer present?

Ferris Mule Deer Herd Unit: The species composition and decadence of the forest and shrub communities on and around Ferris and Seminoe Mountains are the principle management issues.

In using fire or other types of vegetative treatments to alter this condition, what mix of species and habitats would most benefit mule deer? Are these similar or different from what would benefit antelope, elk and bighorn sheep? Most of the coalbed methane wells currently proposed along the Coal Creek drainage lie outside of crucial winter habitats, but these same coal seams extend under winter range and may impact this herd in the future. There is the potential for future coalbed methane development to occur in this area. Increased traffic and construction of pipelines to transport methane may also have affects on crucial winter ranges along the North Platte River. How can the potential impacts of this development be mitigated to reduce the affect on mule deer?

Chain Lakes Mule Deer Herd Unit: Since the majority of mule deer inhabit the more rugged country along the Rawlins Uplift and Lost Soldier Rim, the principle impact to these areas would be by development of the private lands in the checkerboard area and recreational use. In this area there are currently no large impacts occurring. No crucial habitats have been identified in this herd unit, since observations have been sporadic due to the small herd size. Fences are not as big of a concern in this area because the mule deer are more localized and are located on yearlong range; therefore, movements are not as great, but it is still an issue. What type of education program to private landowners could be implemented to reduce impacts to mule deer as private lands are developed?

Baggs Mule Deer Herd Unit: Coalbed methane development is already described for this area under the Baggs Antelope Herd Area and the Sierra Madre Elk Herd Area. Mule deer are probably somewhere between antelope and elk in terms of their tolerance to disturbance.

Bighorn Sheep

Ferris-Seminole Bighorn Sheep Herd Unit: The main issue affecting bighorn sheep are poor forage quality and lack of open habitat throughout their range. This is a result of natural forest succession, conifer encroachment into open spaces, and the suppression of wildfires. Studies conducted on Ferris Mountain have shown that ewes give birth to healthy lambs, but survival of these lambs beyond July is very low. Insufficient high quality forage, competition for forage with elk, and predation are believed to be the principle factors affecting lamb survival. Another issue is the potential for disease transmission between domestic and wild sheep. The conversion of the Stone Ranch livestock operation from sheep to cattle eliminates the chance of this occurring within the herd unit boundary. However, the sheep use still authorized in the Whiskey Peak allotment by the Lander BLM on the west border will continue to pose a health risk to this herd. Fences do cause some problems to bighorn sheep and there have been some deaths, specifically to rams, as a result of fences. Water availability next to summer forage areas is also a concern (personal interview with Greg Hiatt, Wyoming Game and Fish Department). When will the Ferris Mountains Ecosystem Management Plan be finalized and implemented? What type of schedule will the authorized actions follow to improve habitat for bighorn sheep?

Raptors:

Raptors are primarily affected by the abundance of their prey species, which will fluctuate annually as a result of habitat and climate conditions. Factors that influence habitat condition and availability include the impacts that may occur from oil and natural gas development, recreation (falconry practices), subdivision development, and livestock management (condition of habitat for food base). What types of impacts are affecting raptors and what types of mitigation can be implemented to reduce and or eliminate these impacts?

T& E Species:

The issues are closely associated with the health and diversity of habitat types. In general, the healthier an ecosystem is then the T&E species, and BLM-State Sensitive Species tend to thrive and do better.

The only issue relating to bald eagles in this watershed center around the health of riparian vegetation, specifically the health and vigor of cottonwood trees along the North Platte River system. Livestock may affect tree health and vigor along the river system if there is excessive rubbing and browsing that can damage young trees. Beaver will cut down cottonwood trees to eat and build dams with. Lack of high flow events, particularly in stretches of the river where flows are controlled through dam releases, reduces the regeneration of young cottonwood trees. What areas on public lands are being used by bald eagles, is there nesting activity and if so, how successful are they? What types of impacts are attributable to cattle and what actions can be implemented to reduce and or eliminate them?

The only issue relating to black-footed ferrets would be potential impacts to white-tailed prairie dog towns (the major food base and habitat for black-footed ferret) that may occur as a result of natural gas development, coalbed methane development, recreation activities and subdivision development. In general, livestock management should not impact potential black-footed ferret habitat. Where are impacts to white-tailed prairie dog towns occurring? What affects has plague had on prairie dog populations?

There are not any current issues that affect the blowout penstemon plant species since this species actually prefers disturbed areas. What further inventory is needed for this plant species and what monitoring is needed to determine the long-term population trends of the blowout penstemon?

There should not be any management issues with the Canada lynx since this species only use the riparian habitats between ranges during dispersal and it would be unlikely that this species would be traveling through the watershed, although this may occur. There should not be any impacts to this species as a result of implementing actions within the watershed.

There are not any major issues concerning mountain plovers that occur within the watershed area. Mountain plover prefer short-grass systems, where livestock grazing is actually advantageous for this species. Livestock have the potential to step on nests and/or eggs, but this would be by chance and plover are birds that may have double clutches. Where are the known mountain plover occupied habitat areas located, what are the vegetative (or other) criteria that define habitat used by these birds, and what is the reproductive success of these birds using this area?

The North Platte River threatened and endangered species utilize habitat located in Nebraska along the North Platte River. Factors which may affect these species relate to water depletions in the North Platte River system as a result of implementing proposed projects. A proposed project that may result in a water depletion, including evaporative losses, triggers a “may affect” situation and requires a biological assessment to be prepared. Formal consultation with the U.S. Fish and Wildlife Service is required. How many projects within this watershed that have been determined to cause a water depletion to the North Platte River system and have these depletions had any affect on local populations?

Ute ladies' tresses is a plant that is located in riparian habitats. This plant is listed as a threatened species and may be impacted by livestock grazing, but grazing may not cause irreversible impacts to the species. It is considered a "take" only if the entire plant, roots and all, are removed, and grazing does not do this. What locations are most likely to support this plant in order to inventory and determine if it even exists in this watershed? If populations are found then further steps in analyzing current and future management practices would occur.

The Western boreal toad may occur in riparian habitats within the Ferris Mountain ecosystem, but to date the species has not actually been located in this area. Projects that occur in riparian habitats above 7,500 feet should be assessed for boreal toads. If the toad is found, what protection measures, if required, will be implemented to protect the species?

BLM State Sensitive Species:

There are seven mammals, twelve birds, three amphibians, and four plants that have been identified as BLM state sensitive species and may occur, or have the potential to occur, within this watershed area. The main key issues include the lack of information concerning exact locations of most of these species and the affects that authorized actions may have on these species. Monitoring has occurred, and will continue to occur, throughout the watershed area for the greater sage-grouse. There are numerous questions concerning this species - for example, what affects do vegetation treatments (prescribed burns, chemical treatments), grazing management, natural gas development, recreation activities, private land development and roads have on these species? What affects do management practices have on other sensitive species located within the watershed? How much information should be obtained concerning specific species before land management actions are implemented?

Greater Sage-Grouse

Approximate 133 greater sage-grouse leks and associated nesting habitat occurs within this watershed (picture 75-1). Habitat changes within portions of the watershed have been significant. Drought reduces the amount and height of vegetative cover, which may lead to lower nesting success and chick survival for the next year. Drought also affects the production of understory forbs, which may have negative impacts to early brood-rearing, specifically from April through June, which is their critical time period. Water sources placed in the uplands may increase cattle use in areas that grouse use for nesting (picture 75-2). This may affect grouse nesting success and survival of chicks by further reducing herbaceous cover. Wild horse population numbers have increased and are expected to shift their use into the uplands as well, further increasing forage use in sage grouse habitat. Livestock and wild horse use of riparian habitats has led to degradation of species, vigor and cover that is important to late season brood-rearing by sage grouse. What levels and seasons of use by livestock and wild horses in upland and riparian habitat are appropriate in conjunction with the needs of sage grouse and other wildlife? Natural gas activity continues to expand and although seasonal stipulations on BLM-administered land provides some protection to grouse strutting activities, there is no protection on private or state lands for protection during the strutting and nesting time periods. Habitat loss from mineral development and subdivision activities continues (WGFD 2002d). Large scale sagebrush treatments may cause negative impacts if located in nesting habitat, but smaller scale sagebrush habitat conversions (less than 200 acres in size) may actually cause beneficial impacts to nesting grouse. Fences constructed next to strutting grounds may also cause negative impacts to grouse by becoming perches for raptors or obstructions to fly into. What are the cumulative impacts to greater sage-grouse as a result of authorizing actions including natural gas development, livestock

management and associated projects (water development, fences, habitat treatments), recreation activities, and the wild horse management program? What educational programs can BLM become involved in with private landowners to reduce and or eliminate impacts to grouse within and adjacent to private parcels?

3) Current Conditions:

The following describes the current conditions of wildlife populations and their habitat for those species that inhabit the watershed, or have the potential to use habitats within the watershed.

Species of Interest or Concern:

Antelope

Baggs Antelope Herd Unit: The postseason population model estimates about 7,000 antelope, compared to the population objective of 9,000 antelope. This objective was raised from 7,100 animals in 1994, and has yet to reach the objective. The 2001-2002 winter and summer were drier and warmer in Baggs compared to the 1979-2000 20-year average. Although winter survival was good due to these conditions, forage production of shrubs and forbs, both important to antelope, was well below normal in low elevation areas. The 2001 fawn:doe ratio (45:100) is about the same as the five-year average, while the buck:doe ratio was well above the five-year average.

Bitter Creek Antelope Herd Unit: The population objective for this herd was raised from 11,000 to 25,000 antelope, established in 1994. The current population has remained static at about 12,000-14,000 antelope (WGFD 2002b). Climate conditions have been similar to the Baggs Herd Unit, but become even drier the further west you travel. While the Rock Springs area has experienced three to four years of drought, the Rawlins area has just been dry since 2002. The lack of precipitation results in both reduced forage production and quality, as well as water availability in natural seeps and reservoirs. This herd unit and the Red Desert Herd Unit have historically been used by livestock in the winter where they can subsist on snow, so there are fewer reliable water sources and no foothills or mountains with wetter conditions that animals can move to.

Red Desert Antelope Herd Unit: A population objective of 15,000 antelope was proposed and adopted for this herd following public review in 1994. The public is supportive of increasing antelope densities in this herd, except for landowner concerns over higher antelope densities in the checkerboard lands in the southeast corner of Area 61. In addition, this herd is managed to maintain buck:doe ratios above 60:100. The fawn production has declined to 50 fawns:100 does, the lowest in six years, and below the five-year average of 56:100. Fawn production was lowest in Area 60 (38:100), and was also poor in Area 61 (41:100) with the lowest fawn:doe ratio recorded in at least 30 years. Area 64 had the highest fawn:doe ratio (75:100). Poor fawn production is attributed to drought conditions and winter stress on pregnant does during the 2000-2001 winter. Buck:doe ratios declined in all three areas. Yearling buck:doe ratios also dropped in all three areas. Summer precipitation was well below average according to weather data from Muddy Gap and Wamsutter, Wyoming. Maximum temperatures during the summer were more than three-four degrees above average, average minimum temperatures were also above normal. The combination of low precipitation and high temperatures likely affected fawn survival. The

WGFD population model suggests that the antelope herd is about 10 percent below objective size (WGFD 2002a).

South Ferris Antelope Herd Unit: A post-hunt population objective of 6500 antelope was adopted in May 1984 and retained following public review in 1988 and 1994. The herd was near or above objective size prior to the severe 1992-1993 winter, when high losses reduced the herd below objective. Poor fawn production has hindered recovery. The WGFD model indicates losses during the 2000-2001 winter reduced the herd by about 10 percent, and predicts that these losses, combined with poor fawn production in 2001, left the population about 20 percent below objective. The fawn production has declined, and was likely due to summer drought and nutritional stresses on pregnant does during the 2000-2001 winter. The adult buck:doe ratio increased, but the yearling buck:doe ratio decreased. Precipitation in the area was 36 percent below the 30 year average. Maximum and minimum temperatures were above average as well. Low precipitation during the winter and spring months is expected to affect forage production, which may reduce fawn production (WGFD 2002a).

North Ferris Antelope Herd Unit: This herd has been well below the objective of 5,000 antelope since 1986 because of large harvests in 1987 and 1988, heavy losses during the 1992-1993 winter, and unusually poor fawn production in six of the past ten years. Fawn production has improved in the past four years, but the WGFD model estimates the population at just over half of the objective size. The WHGF models shows that the herd size has decreased steadily from 1993 through 1997 as a result of poor fawn production, and although there was some growth in 1998 and 1999, there were losses in the 2000 and 2001 winter. The fawn:doe ratio increased in 2001, the highest ratio recorded in the past 18 years. The yearling buck:doe ratio declined, while the buck:doe ratio improved slightly. The 2001 weather conditions were severe compared to other years. Precipitation in the last several years has been below average. Maximum and minimum temperatures were higher than the norm for the past several summers. The fawn production did not drop in 2001, despite higher temperatures and drier weather patterns. The antelope in this herd are in fair to good physical condition. Low precipitation may affect fawn production in the area, especially since the drought is expected to occur (WGFD 2002a).

Elk

Ferris Elk Herd Unit: A population objective of 350 elk was adopted in 1977 and retained following three subsequent public reviews. This herd was designated for special management in 1988. There was a dramatic increase in 1995 and the herd was estimated at 80% above objective. The herd was almost 30% above objective in 2001. The present drought has had an effect on calf production (WGFD 2002a). However, forage production in most areas is still good, and the creeks and water developments allow elk to use habitat on and away from the mountains. The aging of shrub and woodland plant communities and loss of aspen habitat to conifers due to the lack of wildfires or vegetative treatments is the principle negative factor influencing this herd unit.

Shamrock Elk Herd Unit: The population objective of 75 elk was adopted in 1984 and retained in 1988 and 1994. It is difficult to estimate the numbers in this herd due to movement within three concentration areas of this herd unit and animal movement between adjacent herd units. A trend count in 1998 showed a count of 254 elk. Summer precipitation in 2001 was well below average, while minimum and maximum temperatures have been above normal. These temperatures along with low precipitation may affect calf survival (WGFD 2002a). This herd unit is primarily within a checkerboard land pattern and some landowners minimize hunting on

their lands. Coupled with the difficulty in finding elk in the gently rolling sagebrush terrain has led to growth in their population. Although this is a desert herd unit with the driest conditions, there has also been substantial nonuse by livestock operators in response to the drought that has benefited elk.

Sierra Madre Elk Herd Unit: The herd has been above population objective since the mid-1980s, with post-season populations of nearly 8,000 animals. Adjustments in annual harvests by hunters have lowered elk populations to around 6,500 animals and closer to the objective of 4,200 animals (WGFD 2002b). This herd unit is probably the most productive of the three described. The National Forest and surrounding foothills have been less affected by drought than areas to the west, north and east. There is generally good distribution of reliable water sources between streams and man-made developments. Over the last fifty years there have been many vegetation treatments on public, private and state lands to promote more grass and forbs for cattle, which also benefits elk. Removal of 600 head of wild horses in 1986 from this herd unit also benefited elk, particularly on their winter range, due to the high diet overlap between these two species. Improvements in livestock management with adoption of BMPs has improved range conditions that benefit elk. All of these factors are reflected in both the productivity of this herd and their expansion of use into areas further away from the forest.

Mule Deer

Ferris Mule Deer Herd Unit: This herd has not been near the objective size of 5,000 deer since 1990. Poor fawn production in 1991 and 1992, coupled with heavy losses in the 1992-1993 winter, reduced the herd to less than half of the objective size. Fawn production did not return to normal until 1998. The population is estimated at less than half the objective size, despite nine years of conservative harvests. Fawn production did improve in 2001 with 67 fawns:100 does. The drought has continued through 2001, and the increased fawn survival is probably from spring snowmelt. Low precipitation during the winter and spring months may reduce fawn survival (WGFD 2002a). Condition of riparian habitat and the aging of shrub and woodland communities are the principle factors affecting mule deer in this herd unit.

Chain Lakes Mule Deer Herd Unit: The population objective was increased to 500 deer in 1994, which was the estimated herd size prior to heavy losses during the 1992-1993 winter. The combination of low precipitation and high temperatures likely affected fawn survival, producing a smaller than normal fawn crop (WGFD 2002a). This herd unit is small in terms of deer population due to available habitat. Mule deer primarily inhabit those areas where forage and adequate cover occurs, which is along the uplifts that run from Rawlins north to Green Mountain. Water is also limiting in many locations. A high percentage of the deer in this herd unit are found in or adjacent to the city of Rawlins.

Baggs Mule Deer Herd Unit: The population objective for this herd unit is 17,800 mule deer, which has been one of the few herd units in the State of Wyoming to be at objective levels in recent years. The 2002 population model showed about 21,000 deer postseason, and it may have been as high as 27,000 in 1987. Winter conditions have been mild the last couple of years. However, these have been offset by dry summer conditions, which has lowered forage production and quality, especially at lower elevations. On the other hand, implementation of grazing BMPs has led to improvement of riparian habitat and condition that benefits mule deer. Water developments also aid deer in surviving dry periods. Vegetation treatments have increased grass and forb diversity and production. Mule deer seek out treated areas close to cover, particularly

during green-up. The condition of crucial winter range around Baggs is the principle limiting factor to this deer herd in terms of habitat.

Bighorn Sheep

Ferris-Seminole Bighorn Sheep Herd Unit: There are approximately ten to twenty bighorn sheep that reside within the Ferris-Seminole ecosystem. These sheep may be moving between this area and adjacent mountain ranges. At this time, there is no hunting permitted by the Wyoming Game and Fish Department

Raptors

The raptors previously listed all nest and forage within the watershed. Bald and golden eagles often stay year-long, while other species migrate to warmer climates. The rough-legged hawk spends the winter in the watershed and migrates further north to nest. Prey species are common, with their abundance varying year to year due to climate. Monitoring occurs in some areas of the watershed to determine nest activity and status where broad scale oil and gas activity occurs. In other locations, timing stipulations to avoid disturbance during nesting seasons are used on a project specific basis. Nest sites are for the most part natural, however, artificial nests are used to mitigate conflicts between human activities and nest locations by ferruginous hawks and golden eagles.

Threatened, Endangered, Proposed, and Candidate Species:

The following paragraphs describe the current status of threatened, endangered, proposed, and candidate species that may occur, or have the potential to occur within this watershed. Species may use portions of the watershed during their entire life cycle or portions of their life cycle.

Bald Eagle

Although there are known bald eagle nests located along the North Platte River drainage, at this time, the actual number of new nests that may occur within the watershed have not been updated. Most of the bald eagle nests are located further north in the Casper Field Office area. Winter habitat has not been identified in the RFO area.

Black-footed Ferret

There are white-tailed prairie dog towns located within this watershed and many of these towns are active. At this time, an actual map of all of these towns has not been completed and surveys would be needed to refine any map that is prepared. Although prairie dog towns are located within this watershed, and some have the potential to support black-footed ferrets, no known black-footed ferrets have been recently identified within the watershed area.

Blowout Penstemon

There are identified areas to the south-east and east of Ferris Mountains that contain populations of blowout penstemon. Continued monitoring of this plant species will occur to determine the extent of the populations.

Canada Lynx

Although it is highly unlikely that lynx will reside within this watershed, they may travel through the watershed, specifically using riparian habitats. Lynx are very secretive and are difficult to monitor; therefore, numbers of lynx are hard to obtain.

Mountain Plover

Mountain plovers occur in this watershed and have the tendency to return to the same areas each year. Known locations are around Wamsutter and on the north side of the Ferris Mountains. However, large amounts of suitable habitat are available across the watershed, and sightings have usually been associated with clearances for natural gas development or projects. Occupied habitat is defined as two or more observations of mountain plovers within two miles of each other during one breeding season of any of the following: territorial adults, nests, adult distraction displays, and/or broods. Mountain plover have been observed in this watershed during the reproductive period between mid-April through mid-July.

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid

The North Platte River species include the endangered Eskimo curlew, interior least tern, pallid sturgeon, whooping crane and the threatened piping plover, bald eagle, and Western prairie fringed orchid. Although these other species are not located within the watershed, other than the bald eagle, any proposed projects leading to a water depletion within the North Platte River ecosystem must evaluate impacts to these downstream species.

Ute Ladies' Tresses

Although the Ute ladies' tresses has not been identified to exist in this watershed, it has the potential to occur and the Service has concluded that it may occur in this area.

Western Boreal Toad

Since the Medicine Bow Forest is located to the southeast of the watershed, there is potential for the boreal toad to be found in riparian areas on Ferris Mountain. After consulting informally with Dr. Baxter, an expert on the boreal toad, he stated that there is always the possibility that this toad could be found within the Ferris Mountains in riparian areas at or above 7,500 feet in elevation.

BLM State Sensitive Species:

All of the BLM-state sensitive species have the potential to occur within this watershed. There are known nests for ferruginous hawks, and burrowing owls have been observed with some nesting habitat identified. Greater sage-grouse leks are monitored throughout the watershed by the WGFD and the BLM wildlife biologists from March through mid-May each year to determine activity status of each lek. Populations of greater sage-grouse are declining across the West and in Wyoming, however, the actual cause(s) for this decline is unknown. Less is known of other BLM-sensitive state species; however, the habitats for these species is present and inventory or monitoring should occur to determine abundance and habitat use in the future.

4) Reference Conditions:

There are several historical accounts that have described wildlife species that were present within the watershed area during different eras. The following are descriptions that were recorded by homesteaders and explorers that traversed or lived in the watershed in historic times.

Immediately following are historical descriptions of the area that were written by Ruth Beebe, whose father came from West Virginia and settled in the Sweetwater area in 1880. The people she talked about describe some of the wildlife that were present:

This is about Morris Waln and Charles Strong in 1888. The two men were actually murdered while on a hunting trip. The party started to the Sweetwater Mountains in Wyoming, to hunt bear...when Mr. Waln shot an animal-antelope, wildcat, bear, or coyote, he would cut off the ears, tail, or paws, and nail them to the mess box.

Mrs. Boney Earnest (Canzada Brantly, also known as Martha Earnest) lived with her husband on Pick Ranch, located on Canyon Creek, close to both the Sweetwater and Platte Rivers...one of the most interesting sights Mrs. Earnest told about in the early west, was seeing buffalo herds containing no less than 60,000 head, which took ten hours in passing. Mr. Earnest was with the party who shot the last wild buffalo ever seen in central Wyoming.

Mr. Bothwell settled on a large, level plain at the mouth of Horse Creek...He had a large woven wire fence around a pen where he kept ferocious grey wolves, for pets...the neighbors said in hearing their howls, and carryings on, all the outside wolves would gather near his place.

There was a bear hunt at Split Rock on Ed McKinney's and August Lankin's ranches.

The Sun family, including Tom Sun, was one of the earliest families to settle in the area. They began to take up land in the form of desert claims and had a water wheel at Cherry Creek...they have added many more ranches to their vast holdings...Bar Eleven Ranch on Peet's Creek (Pete Creek)...Turkey Track Ranch...66 Ranch from N.D. Bucklin (Bucklin Reservoir)...they also added the mighty Separation Ranch, a part of the Mahoney spread. An excerpt from a diary of Edwin C. Johnson while he accompanied Tom Sun on a hunting trip in 1878 included the following descriptions - break camp and start on prairie covered with antelope and wild geese...Story kills fine buck antelope for camp...Head of Sage Creek at four p.m. Soon after camping, band of elk came within twenty rods of camp, several hundred, all cows and calves...Go out for ride. See thousands of elk...Go hunting in earnest. See bands of elk in hundreds, but big bulls scarce...Take pack horses and go with Tom for horns I killed last night...we see that a bear has dragged the carcass eight or ten rods and partially buried it...he proved to be a large male grizzly species...I killed a black tail deer...They report lots of buffalo...In about two miles see a bunch of sheep on the highest peak, about thirty...This old cabin is full of mountain rats, so I will set a trap for them, as they pack off all our provisions...numerous rattlesnakes. (Basically, these two hunters shot and killed mule deer, rattlesnake, antelope, bison, grizzly bear, bighorn sheep, pack rats, and elk in their hunting trip from August 27, 1878 to October 6, 1878).

In 1893, Stuart Joseph Sharp (Ruth Beebe's father) married Virginia Clark. They had a ranch at the foot of the Ferris Mountain on Cherry Creek. Mrs. Sharp was delighted to see herds of antelope that would walk right past her door, flocks of sage chickens that dusted themselves in the woodpile, even the mountain lions that crashed through the willows on the creek, grey wolves...to say nothing of the coyotes she heard every night.

In 1906, the Ute Indians ran away from their reservation at the White Agency, in Colorado. As they poured through Whiskey Gap with one thousand ponies, their dogs, and all their possessions...they set up their teepees there. They turned their horses loose, and invaded the valley, and when they left there wasn't an antelope, deer, rabbit, sage chicken, or prairie dog in the country...At every teepee was a campfire, and a prairie dog roasting.

Albert A. Harper purchased the Hay's place in 1895. He was constantly trapping for wolves and mountain lions. He caught a golden eagle in a trap.

According to Ruth, the worst winters were in 1919-1920 and 1949. In 1972, the plants in the valley include mountain pinks, cactus - the strawberry or pink variety, Grizzly Bear (has yellow blossoms), pink and white

primrose, Sego (mariposa) lily, Yucca (Spanish Bayonet, Soap Weed or Candles of Heaven), coral pink gilia (or sky rocket), yellow and purple violets, shooting stars (or Baird's bills), wild iris, wild rose, columbine, wild tiger lilies (found along Whiskey Creek), lavender wild geranium, showy fleabane (Last Days of Summer), sunflowers, gaillardia, Indian paint brush, larkspur, loco (ivory and purple), caitail. The birds included the eagle, hawks, owls, cranes, Canada geese, ducks, sage grouse, blue grouse (both are prominent), prairie chicken (different kind of bird) – songbirds include robins, wild canaries (or golden finches), mourning doves, catbirds, mocking birds, phoebes, horned larks, blue birds, swallows, woodpeckers and flickers, juncos, the black capped chickadees, and meadow larks, killdeer, red winged blackbirds, ruby throated hummingbirds, whipporwill, magpie, crows, and common blackbirds. Big game species included antelope, deer, and elk (Beebe 1973).

John Charles Frémont was an explorer in the Sweetwater country in the early to mid-1800s. He wrote descriptions of the country as he traveled through and described some of the wildlife that he observed below:

We saw here numerous herds of mountain sheep, and frequently heard the volley of rattling stones which accompanied their rapid descent down the steep hills...we gave the encampment the name of Goat Island...This morning we left the course of the Platte, to cross over to the Sweetwater...A long and gradual slope led from these hills to the Sweetwater, which we reached in fifteen miles from Goat Island...I made an early encampment here, in order to give the hunters an opportunity to procure a supply from several bands of buffalo, which made their appearance in the valley near by...The hunters went ahead this morning, as buffalo appeared tolerably abundant, and I was desirous to secure a small stock of provisions; and we moved about seven miles up the valley, and encamped one mile below Rock Independence (Independence Rock)...Several bands of buffalo made their appearance to-day, with herds of antelope; and a grizzly bear – the only one we encountered during the journey – was seen scrambling up among the rocks (Fremont 1856).

Jim Baker was a trapper and explorer that traveled through this watershed in the early to mid-1800s. Taylor Pennock, in an article entitled *Recollections of Taylor Pennock*, has related a couple of stories which help to describe the individuality of Jim Baker. This story refers to an area near Brown's Hill near Savery, Wyoming – to the south of this watershed – and to the Red Desert.. Pennock recalled:

One day Jim Baker told us a story about his buffalo hunting. He was with a big party of Indians camped over near Brown's Hill on the Savery...There was a string of buffalo passing all the time and it took herds three weeks to pass, coming from the North Park country (Colorado) where they had their summer range and going to the Red Desert for the winter (USDI-Heritage Conservation and Recreation Services).

5) Synthesis and Interpretation:

From the accounts above, the detectable changes in wildlife are the disappearance of the buffalo, grizzly bears, and wolves within this watershed. Livestock impacts, although still present, have been reduced, and range conditions on upland and riparian habitats are improving in most areas (USDI-BLM 2002). Antelope, elk, and mule deer are generally thriving, and Wyoming has the largest population of greater sage-grouse in the country. Development in Wyoming has not occurred at the rate that it has in other states; thereby reducing the habitat loss and fragmentation. Native plant species are still present and weeds, although present in some areas, have not taken over large areas of the range. Wild horse numbers were recently above objective, and, along with the drought, may have been impacting wildlife species. Impacts from oil and natural gas development, off-highway vehicle use, and loss of or modification to habitats from developments on private land in checkerboard areas continues to increase. (USDI-BLM 2002). The lack of fire has led to a predominance of mature to decadent shrubs in some areas, and conifer encroachment has occurred along the Ferris Mountains. The following analysis specific habitat conditions within the watershed and the effects these may have on wildlife species.

Species of Interest or Concern

Antelope

The presence of antelope in Wyoming was noted by all of the early explorers and emigrants that moved to or across the state. Antelope are still the most visible and abundant big game species in this area, due to open expanses of sagebrush dominated rangelands with only limited habitat loss and fragmentation. The health of Wyoming big sagebrush communities that antelope depend upon is generally good. High cover and density of shrubs that limits understory species is only observed at higher elevations and precipitation. In this assessment area the crucial winter ranges do not receive enough concentrated animal use to show high utilization rates or severe hedge classes. There appears to be a good mix of winter, summer and transitional habitat to support existing populations and objective levels of antelope. Antelope, being the smallest of the big game species, is probably more susceptible to die-offs during severe winters. However, their reproductive capacity also allows them to respond more quickly after such events to repopulate their habitat.

The presence of many miles of woven wire fencing and its affect in hindering or altering antelope movement is the most important issue needing to be addressed. Most livestock use is made by cattle, and what sheep use is made employs the use of herders, so woven wire fencing is not needed for control of livestock. Outside of the Daley allotment (mid-1980's) and a few spots on the Jawbone allotment, very little fence modification has occurred over the last 20 years. Research conducted in the early 1980's in the Red Desert antelope herd unit showed that woven wire fences were a significant hindrance to antelope movement during severe winter weather. Modification of fence corners and other key locations should become part of the annual goals and accomplishments of the Rawlins Field Office to address this issue. In the 1970's, small cattleguards called antelope passes were installed in corners of some woven wire fences to improve antelope passage. Their small size, however, allowed cattle to move across them and it is unclear whether they actually helped antelope. Most have silted in and been fenced off. Private land that is sold to people as homesites, if developed with fencing and other facilities, could pose tremendous impacts on antelope habitat and movement in checkerboard areas. Informing people about the potential impact to wildlife of these actions may help address this situation, or on a broader scale, exchanging lands to block up public land to maintain wildlife habitat should be pursued.

Livestock management affects antelope in a number of ways in addition to fencing. Sheep compete with antelope for forage, however, sheep use only makes up about 10% of all livestock use currently occurring in the Rawlins Field Office, so this is not as important an issue as it would have been 50 years ago. Water development also can affect antelope. The creation of new sources of water has allowed antelope to expand their use into areas that formerly did not have reliable water. On summer range this is a benefit, but increasing seasonal use on winter range may have a negative affect on the vegetative resource. In these latter areas, the use of controllable facilities, like wells, is preferred in order to not encourage year-long use of winter range by antelope. The problem of livestock water being turned off when wildlife use is still needed should be addressed on a case by case basis. This may vary depending on the climate conditions experienced each year, what other water sources are available, and whether animals can move to water sources in other pastures or allotments. Agreements with some livestock producers, as well as voluntary efforts by ranchers and industry, are already in place where water is left on for wildlife for specific time periods or as needed. Water projects developed for wildlife that are in disrepair should be maintained or removed. Interest groups or individuals may be willing to voluntarily oversee and maintain these types of projects.

Oil and gas development is another significant influence upon antelope in the assessment area. Roads, well pads and other facilities result in a long-term loss of habitat, while pipelines that are reclaimed fairly quickly, only result in short-term loss of habitat. The dust off roads that drifts downwind and coats the vegetation may indirectly result in vegetation being unusable on a seasonal basis. Antelope appear to adapt to the increase in traffic and human activity, having a greater tolerance to this type of disturbance than mule deer or elk. Water sources developed in conjunction with natural gas wells provide additional sources of water and expand the range of country that antelope can utilize. Whether infield drilling with closer well spacing or expansion of natural gas and coalbed methane development into new habitat will alter the behavior and health of antelope from what is observed currently is unknown.

The Wyoming big sagebrush habitat that antelope depend upon as their principle habitat and forage source is stable and long-lived. While plant succession in this community type is relatively slow, it is occurring and changing over time. For antelope, greater sage-grouse, and other sagebrush obligate species, it is important to maintain healthy stands of big sagebrush, with a diverse mixture of grasses, forbs and shrubs. The type and amount of disturbance required for this to happen still needs to be determined. The use of prescribed fire, natural fire, or chemical treatments and their respective affects in this plant community are currently being studied in this watershed to try and answer some of the questions and improve future management. Natural gas pipelines and other reclamation areas also offers an opportunity to change or manipulate this community on a smaller scale.

Elk

Prior to the arrival of white men, elk were common but probably competed with bison for forage and space. At this time, elk are doing well across Wyoming and this watershed area follows a similar trend. All three herd units have current populations that exceed the population objectives and have for several years. This would indicate that elk are thriving, have good reproductive rates, and have the habitat to support them. In general, there are no significant problems with any winter or summer ranges that elk utilize. However, elk use has increased on private hay meadows along Muddy Creek. Drier conditions than average in 2002 may have lowered calf survival rates. Although diet overlap is high between elk and cattle, there appears to be enough forage to provide for the needs of both at current levels of use. Changes in elk distribution on the Cherry Creek and Buzzard allotments may change as allotment management plans are revised. As best management practices for cattle continue to be implemented or improved, forage production and availability for elk should be increased. Elk and wild horses also overlap in diet, however, only the Shamrock elk herd area has a small degree of overlap with the wild horse herd area.

The management issue which affects all three elk herd units are fences. Modifications to fences have occurred in a few areas, like on the Buzzard allotment, but much more work is needed. Priority spots for modification must be identified and a minimum of ten miles of fence modification annually should be achieved. New fences are being built to BLM standards to improve the ability of wildlife in general to get by them. The use of electric fencing is increasing and it appears to have lower impacts on wildlife than conventional barbed wire fencing. Elk, in particular, are not as likely to be injured and cause less damage to this type of fence, which also results in lower maintenance costs. It is being used as pasture fencing in the Fillmore and Cherry Creek allotments in order to improve livestock management while minimizing impacts to wildlife. The practice of leaving gates open in pasture fences when they are not needed should also be promoted more. In many cases this simple idea could help wildlife passage, especially during severe conditions.

In addition to fences and livestock management, the Ferris elk herd is affected by the increasing age and decadence of the shrub and woodland communities. As trees and shrubs increase in dominance, the cover and production of the grasses and forbs that elk rely upon decrease. The loss of aspen habitat for cover and forage, especially later in the summer when forage in other areas has dried up, has negative impacts on elk. Completion of an ecosystem management plan for this area, with vegetative treatments to provide a diverse mixture of plant communities, age classes, and structure, would benefit this elk population.

The Baggs elk herd has increased in both the local population that stays year-round on Atlantic Rim, as well as the migratory population that summers in the national forest and winters on Atlantic and Red Rim. The local population has benefited from improved livestock management practices and vegetative treatments, which have increased forage quality and production. Elk herds are pushing winter habitat boundaries farther to the north and west due to improved forage conditions and prescribed burning (USDI-BLM 2002). The concerns with this elk herd are with coalbed methane development and the amount of human activity that results from it. Since elk avoid roads and associated human disturbances, the placement of roads and the amount and timing of the use of roads will be a factor in the long-term use by elk in this area.

The Shamrock elk herd is likely to be the most affected elk herd in this watershed in terms of long-term impacts of development and disturbance. Natural gas field development on the west side of this herd unit will likely reduce habitat available to elk. Whether this activity will continue on the east side of the Continental Divide is unknown at this point, but if it does there could be significant impacts to this elk herd. Roads constructed for natural gas extraction are also used by recreationists, which can result in additional human activity resulting in elk avoiding these areas. Land sales and buildings, fences, or other activities in the checkerboard areas of this herd unit would also create more disturbance to elk. Even though habitat may not be changed, the avoidance by elk of areas with human activities occurring on a regular basis still results in a loss of habitat to these animals. On the other hand, water developments, improved livestock management, and vegetative treatments could all help improve the habitat for and distribution of elk in this herd unit.

Mule Deer

Mule deer were common in this watershed historically, based on the journals of explorers and early hunters like Tom Sun. Although still common today, their status varies in different areas of the state and even within this assessment area. The general belief is that trends in mule deer populations are following trends in the health of upland sagebrush and mountain shrub communities. The Baggs mule deer herd has been maintained at the population objective for a number of years, and until recently was one of very few herd units that was issuing doe/fawn permits. This would indicate that habitat conditions are generally good, compared to other herd units where mule deer populations are well below the population objective. The habitat within this herd unit has shown tremendous improvement following changes in livestock management, development of water sources, and vegetative treatments. Riparian and upland habitats, that are both important to mule deer, have improved in terms of cover and/or composition of forbs, grasses and young shrubs. The principle concern within this herd unit are the potential impacts from coalbed methane development. Mule deer are more tolerant of disturbance than elk, but depending on how and where CBM development occurs will determine the actual affect in this herd unit.

Mule deer populations in the Ferris herd unit are stable but below the population objective. Poor fawn crops and die-offs during severe winter weather are climate related factors that can't be altered. Habitat and forage for mule deer are the factors that can be manipulated by land managers. The descriptions for Standards 2 and 3 indicate where improvement could occur, primarily in riparian habitat and shrub and woodland communities on and adjacent to the mountains. Riparian habitat is primarily influenced by cattle grazing. Use of best management practices, like those implemented on the Bar Eleven and Long Creek allotments, would improve shrub and herbaceous species important to mule deer. The dominance of mature to decadent shrub and conifer communities is also affecting mule deer. The use of vegetative treatments or natural fire to promote a diverse mixture of species, age classes, and structure would also benefit mule deer populations. Competition for forage between mule deer and livestock is highest with sheep. The conversion of the Stone Ranch from sheep to cattle will reduce this direct competition. However, all other ten sheep permits have already been converted around the Ferris and Seminole Mountains, so this last one will have some, but not necessarily significant benefits to mule deer. Modifications of fences in key locations would also assist mule deer movement and survival, similar to the description in the elk section above.

The Chain Lakes mule deer herd is relatively small, subsisting along the rougher terrain of the Rawlins Uplift and Lost Soldier Rim where hiding cover and scattered patches of aspen and mountain shrubs intermix with the sagebrush. Although the population within this herd unit will likely stay about what it is due to limited habitat, there is potential to improve the existing plant communities. Similar to other big game herd units, stands of shrubs and trees are mature to decadent. Treatments to create more diversity in these communities would benefit mule deer. The topographic relief of the uplifts form some natural deterrents to cattle movement that wildlife still pass over, so the overall miles and density of fences is less in this area than in other herd units. However, there are still locations that could be modified to help mule deer move across their habitat, particularly for young deer and woven wire fences.

Bighorn Sheep

Based on historical accounts, bighorn sheep were more abundant in the 1800s than they are at the current time. In the 1980s most of the sheep were observed using the Seminole Mountains. A transplant of bighorn sheep from Whiskey Mountain by Dubois to the Ferris Mountains was completed in 1984. The sheep from this transplant along with the remaining sheep on the Seminole Mountains have dwindled to the few observed today. The factors believed most likely to have contributed to this decline are conifer encroachment and decadence of vegetation in preferred habitats, forage competition with livestock and elk, and diseases transmitted from domestic sheep. The lack of fire within the high elevation ecosystem has altered the vegetation on mountain meadows. Sheep depend on forage and open habitat on the mountain meadows that are close to security areas. They must also move across the mountain and between security areas. As plant succession occurs and conifer cover increases, their susceptibility to predation increases and the sheep appear more nervous and stressed. If natural and prescribed fire can be implemented to reduce the amount of conifers and promote more composition and production of grasses and forbs, this would likely be the single most beneficial action to maintain bighorn sheep on the mountain. If the use of fire can not be achieved, it is unlikely that bighorn sheep will survive in this ecosystem. The diets of bighorn sheep are very similar to those of cattle and elk. Forage use by cattle (more on gentle slopes adjacent to the mountains) and elk use on the mountain reduces the quantity and quality of forage available to bighorn sheep. The implementation of livestock grazing systems to maintain or improve plant vigor, cover and production and maintaining elk populations at objective levels should provide adequate forage for bighorn sheep.

Bighorn sheep have been impacted from juxtaposed domestic sheep allotments. Domestic sheep have been known to transfer several diseases that can be fatal to wild sheep. Most ranches in this area have changed from sheep to cattle over the last forty years. The Stone Ranch is the last livestock operation within the watershed to complete a conversion from sheep to cattle, which should have a positive effect on bighorn sheep. However, the continuation of sheep use immediately to the west within the Lander office area of the BLM will still pose a threat for disease transmission as wild sheep move between the Ferris Mountains and Green Mountain.

Raptors

Raptors are primarily affected by climate (indirect affects on prey species) and human activities around nesting and perching areas. Ferruginous hawks and to a lesser extent golden eagles, will sometimes nest on man-made structures, such as gas well facilities, windmills, and old corrals and buildings. Artificial nests are used to draw the birds away from these sites so that human activities do not force the abandonment of active nest sites. These artificial nests have also been documented to be more productive in terms of the number of birds fledged per nest compared to natural sites. There are currently 101 artificial nest sites, with about 50% being actively used (picture 87-1). The BLM has a timing stipulation for raptors attached to any proposed project that is located within $\frac{3}{4}$ of a mile to one mile (depending on each species) from any nest that prohibits surface disturbing and other activities from occurring between February 1 and July 31. In addition, the Bald Eagle and Golden Eagle Protection Act, 16 U.S.C. 668, prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagles or their body parts, nests, or eggs, which includes collection, molestation, disturbance, or killing. The ferruginous hawk and burrowing owl are BLM-State Sensitive species that are found within this watershed, while the northern goshawk and peregrine falcon have the same status and have the potential to occur within this watershed (picture 87-2).

Threatened, Endangered, Proposed, and Candidate Species:

The threatened, endangered, candidate, and proposed species that have the potential to occur within this watershed include the bald eagle, Canada lynx, Ute ladies' tresses (threatened); black-footed ferret and blowout penstemon (endangered); Western boreal toad (candidate); and mountain plover (proposed). The North Platte River species (least tern, pallid sturgeon, piping plover, whooping crane, Eskimo curlew, and Western prairie fringed orchid) are not actually physically located within this watershed; however, water depletions that occur within the North Platte River system, and within this watershed, may cause an impact to these downriver species. The BLM wildlife biologists complete informal and/or formal conferencing and/or consultation with the Service for all proposed projects that may contain habitat, or the species themselves, to avoid adverse impacts to threatened, endangered, candidate, and proposed species.

Threatened Species

There are no known bald eagle nests located within this watershed area, but bald eagles have been observed and have the potential to nest along the North Platte River, which is the eastern border of the watershed. According to the Wyoming Game and Fish Department Bald Eagle Completion Report of 2002, the population of bald eagles statewide has continued to increase. In 2001, there were 89 pairs of bald eagles that produced 86 young in Wyoming (WGFD 2002c). Bald eagles are most commonly observed using cottonwood woodland habitat along major rivers. The majority of the habitat type within the RFO is located on private, state, and BOR administered

lands. Bald eagles observed using BLM administered public lands are usually found scavenging big game or other wildlife carcasses in wintering areas. The BLM has a timing stipulation attached to any proposed project that prohibits surface disturbing and other activities from occurring between February 1 and July 31. This stipulation is attached to any project or activity that is located within one mile of a bald eagle nest. Generally, projects are not located beneath or even close to bald eagle nests; therefore, there should not be any impacts to nesting bald eagles as a result of authorizing actions on BLM-administered lands. In addition, the BLM has a winter raptor timing stipulation that prohibits surface disturbing and other activities from occurring between November 15 and April 30 for the protection of winter concentration areas.

The Canada lynx may travel through the watershed and use woodland and adjacent riparian habitats. The closest known lynx populations occur in the Colorado Rocky Mountains to the south and in the Wind River Mountains to the northwest. In general, there should not be any impacts to dispersing Canada lynx as a result of authorizing actions on BLM-administered lands.

The Ute ladies' tresses has not been specifically identified within this watershed. The only known locations within the State of Wyoming are located in Converse, Goshen, Laramie, and Niobrara counties at elevations between 5,000 and 6,000 feet. However, since the plant has been located in adjacent states, the Service believes it may occur in more locations within Wyoming. Site specific field investigations occur for all projects; therefore, the Ute ladies' tresses will be surveyed on any project that may be located within or near riparian habitat.

Endangered Species

The black-footed ferret has the potential to occur within the watershed. Since ferrets inhabit prairie dog towns, these sites are identified and delineated over broad areas or on a site specific project basis. All proposed projects have a field site investigation completed prior to disturbance to determine if suitable habitat for the ferret exists. Projects are located outside of suitable habitat or black-footed ferret surveys are completed. The BLM biologists informally or formally consult with the Service when black-footed ferret surveys are completed. There have not been any black-footed ferrets found in any surveys that have been conducted within this assessment area. In general, there should not be any impacts to the black-footed ferret as a result of authorizing actions on BLM-administered lands.

The blowout penstemon is located within shifting sand dunes or wind carved depressions on the south side of Bear Mountain, which is between the Ferris and Seminoe Mountains. Inventories have been conducted over the last three years, and additional surveys are being conducted by BLM wildlife biologists to determine the extent of these populations. The most current population count (2002) documented around 4,000 plants with a total estimated population of 4-5,000 plants. The blowout penstemon occur on north and east facing slopes and adjacent bottoms of steeper unstabilized sand dunes, which retain moisture longer during the summer ([picture 88-1](#)). Current utilization of these plants by livestock or wildlife is acceptable in amount and there does not appear to be any other potential impacts that may affect known populations. Generally, most authorized actions on BLM-administered lands are not implemented on shifting sand dunes due to the instability of these areas. Site specific field investigations occur for all projects; therefore, the blowout penstemon will be surveyed on any project that may be located in shifting sand dunes or wind carved depressions. In general, there should not be any impacts to the blowout penstemon as a result of authorizing actions on BLM-administered lands.

Candidate Species

The Western boreal toad has the potential to occur within riparian habitats above 7,500 feet in elevation. There is the possibility that this toad may be located in riparian/wetland habitat on Ferris Mountain. No surveys of this habitat have been conducted. Site specific field investigations occur for all projects; therefore, the Western boreal toad will be surveyed on any project that may be located within or adjacent to riparian habitats above 7,500 feet in elevation. In general, there should not be any impacts to the Western boreal toad as a result of authorizing actions on BLM-administered lands.

Proposed Species

Mountain plover have been observed in short-grass prairie and shrub-steppe habitats that have sparse to moderate cover of vegetation on upland locations ([picture 89-1](#)). These sites can be quite variable, ranging from saltbush steppe with high amounts of bare ground to Wyoming big sagebrush, black sagebrush, or Wyoming three-tip sagebrush communities with good grass and forb cover. These birds are also known to inhabit prairie dog towns. There are vast amounts of suitable habitat for these birds within this watershed and throughout the entire Rawlins Field Office area, however, much of this habitat is currently not being used or has not been surveyed. Inventories for this species have primarily been conducted around Wamsutter due to oil and gas field activities, where several hundred mountain plover have been documented. Several sightings of these birds has also occurred on the gently sloping plateaus found on the north side of the Ferris and Seminoe Mountains. Long-term monitoring of mountain plover to determine occupied habitat and concentration areas is a component of the Greater Wamsutter/Continental Divide EIS for oil and gas development. Other studies are also ongoing to study diet and habitat selection in order to establish parameters for further definition of suitable habitat. The BLM has a timing stipulation attached to any proposed project that prohibits surface disturbing and other activities from occurring between April 10 and July 10. This stipulation is attached to any project or activity that is located within potential mountain plover habitat. The timing restriction protects the mountain plover during the critical nesting period; therefore, there should not be any impacts to nesting mountain plovers as a result of authorizing actions on BLM administered lands. In addition, the BLM has additional protection measures that may be applied to proposed projects and activities that occur within known mountain plover occupied habitat. Occupied habitat is an area where broods and/or adults have been found in at least two of the past five years.

BLM State Sensitive Species:

Protection measures for BLM-State Sensitive Species, other than those required for raptor and greater sage-grouse, have not been identified in the RFO area. The Migratory Bird Treaty Act, 16 U.S.C. 703, enacted in 1918, prohibits the taking of any migratory birds, their parts, nests, or eggs except as permitted by regulations and does not require intent to be proven. This Act and its regulations should protect the white-faced ibis, long-billed curlew, sage thrasher, loggerhead shrike, Brewer's sparrow, sage sparrow, and Baird's sparrow from actual destruction of the nests and or the bird itself. Habitat loss and or degradation is more difficult to measure and mitigate for these species. The long-eared myotis, fringed myotis, spotted bat, and Townsend's big-eared bat usually inhabit caves, rocky outcrops, and abandoned buildings. Again, habitat loss and or degradation is more difficult to measure and mitigate for these species. Wildlife biologists monitor white-tailed prairie dog towns for potential black-footed ferret habitat and protect these habitats by moving projects 50 meters from existing towns. There are occasions when a project may be constructed within a white-tailed prairie dog town after the towns are surveyed for black-

footed ferrets and no ferrets or their parts are observed. In general, this does not happen very often and project proponents are encouraged to move the projects outside of existing white-tailed prairie dog towns for the protection of not only the prairie dogs themselves, but for other species such as the mountain plover and burrowing owl that depend on the prairie dog town ecosystem. The swift fox may travel through the watershed and should not be impacted by proposed projects that occur as a result of implementing BLM-authorized actions. Little information is known about the habitat locations of the dwarf shrew, Wyoming pocket gopher, and Idaho pocket gopher and the impacts to these species from authorized actions. A field site investigation is completed for all proposed projects and the BLM-State Sensitive plant species can be monitored at that time, and/or their likelihood of occurring should be noted in the event that additional field site investigations are required.

Greater Sage-Grouse

The greater sage-grouse is commonly found throughout the watershed area. Although Wyoming has healthy but declining populations of this species, there are opportunities to improve both upland and riparian habitats used by these birds. In many areas, existing grouse habitat contains too much big sagebrush, lack of species diversity and forb abundance, and not enough residual cover for high nesting success. Greater sage-grouse habitat recommendations developed for Wyoming, which are based on research conducted within Wyoming, can be used for assessments to determine current condition and where the need exists for vegetative treatments. Reclamation efforts should also receive more attention in terms of how it is completed that would most benefit grouse. In particular, the use of more forbs, including succulent species, should be considered in seed mixtures. Summer and fall brood-rearing habitat is especially dependent on riparian habitat, which is most influenced by livestock management. Stream segments that are not in proper functioning condition are also not likely providing high quality habitat for sage grouse. Implementation of livestock grazing BMPs would improve the use of both riparian and upland habitats for greater sage-grouse. For instance, the primary goals of the recently constructed enclosure on lower Stewart Creek is to protect the water sources and manage the habitat to benefit the grouse that utilize this area. Creating new water sources for wildlife use and operating livestock water sources for wildlife when livestock are not present are two other methods of improving habitat use by grouse. Manipulation of wild horse distribution and utilization where they overlap with grouse habitat would also benefit this species. Another tool the BLM uses is a timing stipulation attached to any proposed project that is located within two miles of a lek that prohibits surface disturbing and other activities from occurring between March 1 and June 30 for the protection of strutting and nesting greater sage-grouse. Generally, projects are not located within ¼ mile of an identified lek; and proposed projects should be moved as far away from an active lek as possible. The timing stipulation reduces impacts to breeding and strutting grouse; however, the two mile buffer has been debated by wildlife biologists. Recent research conducted within Wyoming indicates that only 40% of the hens nest within this two mile buffer. Suitable nesting habitat may be selected as far away as 20 miles from the lek. The BLM has a winter greater sage-grouse timing stipulation that prohibits surface disturbing and other activities from occurring between November 15 and April 30 for the protection of winter concentration areas.

6) Recommendations:

Habitat needed to support healthy wildlife populations and listed or proposed threatened and endangered species is generally in acceptable condition. This does not mean that there aren't problems or concerns about wildlife habitat. The discussion under Standard #2 – Wetland/Riparian Health and Standard #3 – Upland Plant Health outlines the current conditions and recommendations for improving management of these resources. In many cases we may be

meeting a standard but we fell short of our “desired or future” condition. On the other hand, our composition of native species is good, with just spot problems at this time with weeds. Due to the existing good condition of native vegetation and its ability to support the diverse wildlife populations we currently have, it is determined that the majority of Great Divide Basin assessment area is meeting Standard #4 with respect to wildlife. The principal area deemed not to be meeting Standard #4 for wildlife habitat is the Ferris Mountains, due to loss of aspen habitat and the disease, decadence, and encroachment of conifers into shrubland and riparian habitats. This area encompasses about 24,000 acres of public land. The following recommendations address action to help meet future desired resource conditions. Livestock grazing is not a principle factor in the non-attainment of this standard.

Implement recommendations described for Standards #2 and #3. Improving the health of riparian/wetland and upland plant communities will help meet the needs of all wildlife, which use this watershed.

Species of Interest or Concern

Antelope, elk, mule deer, and bighorn sheep

Modify existing sheep-type fences and older cattle-type fences to meet BLM standards. This should be accomplished in key locations in the short-term, while working towards all fences in the long-term. A specific number of miles should be accomplished each year, and cooperative efforts should be pursued with grazing permittees, WGFD, and conservation districts. When possible, relocate fences to reduce impacts to wildlife movements. Encourage livestock permittees to leave gates open when not needed and/or through as much of the fall through spring seasons to help wildlife move between seasonal ranges. Documentation of locations where fences are affecting big game movements should continue, particularly for the new fences such as the pasture fences in Cherry Creek allotment or the Seminole Road highway fence. Impacts to big game species due to CBM development should be mitigated, possibly by modifying existing fences to improve access to less disturbed winter habitats (WGFD 2002a).

Management plans should consider other grazers, such as wildlife and wild horses, in making recommendations and to properly assess impacts. Water developments should benefit as many species as possible. This includes running projects in the summer even after livestock have left. In winter ranges, projects should be controllable, or small (ephemeral) in nature, to not encourage year-round wildlife use. Isolated desert water sources and associated riparian habitat should be protected and managed to meet the needs of wildlife. Encourage the Lander BLM to convert domestic sheep AUMs in the Whiskey Peak allotment to cattle to prevent disease transmission to bighorn sheep using Ferris Mountain. Monitoring information, particularly trend data for big game crucial winter range, should be coordinated with the WGFD for use in evaluating and changing herd objective levels.

Complete the Ferris-Seminole Mountains ecosystem plan, including public input and review, to improve habitats to support wildlife. Implement vegetative treatments in shrub and woodland habitats to improve the diversity of cover, species, age-class, vertical structure, and mosaic mix of plant communities. Management efforts should also emphasize the use of naturally ignited fires to benefit resource values in accordance to preplanned conditions and objectives outlined in a Wildland Fire Implementation Plan. Monitor the effects for all treatment projects, to document and analyze results and improve future prescriptions to achieve management objectives. Utilize habitat recommendations for greater sage-grouse and other species where available in both

assessing and planning habitat treatments. Encourage the development of interagency long-term habitat treatment plans (WGD 2002b).

Maintain wild horse populations within established herd population levels. Monitor to evaluate the impacts on vegetative communities and wildlife habitat and whether these levels represent a proper long-term population of wild horses.

Evaluate the need and institute measures where necessary to reduce disturbance to big game species on crucial winter ranges, or other habitat areas where needed. This could involve seasonal closures of roads, seasonal closures of habitat for antler collecting, general off-highway vehicle use, transportation planning for oil and gas development, and other activities. Private landowners should be encouraged to leave their lands unfenced, or use fence designs that are compatible with big game movements (WGFD 2002a).

Raptors

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting raptors which prohibits construction and other activities from occurring between February 1 and July 31. In addition, the BLM should continue to use the seasonal restriction stipulation for identified raptor winter habitat areas which prohibits construction and other activities from occurring between November 15 and April 30.

Threatened, Endangered, Proposed, and Candidate Species:

Bald Eagle:

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting bald eagles which prohibits construction and other activities from occurring between February 1 and July 31. In addition, the BLM should continue to use the seasonal restriction stipulation for bald eagle winter habitat areas which prohibits construction and other activities from occurring between November 15 and April 30.

Black-footed Ferret, Blowout Penstemon, Canada Lynx, Ute Ladies' Tresses, and Western Boreal Toad:

The BLM should continue to complete informal and/or formal consultation with the Service for any proposed project that may be constructed within potential black-footed ferret habitat. Identified stipulations will be attached to all projects to avoid adverse impacts to the species.

Mountain Plover:

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting mountain plover which prohibits construction and other activities from occurring between April 10 and July 10 of each year. In addition, the BLM should continue to use the additional protection measures to protect mountain plover located within known occupied habitat. Further inventories of potential mountain plover habitat would occur, with sighting of plovers documented and descriptions made of the habitats being used.

North Platte River Species: Least Tern, Pallid Sturgeon, Piping Plover, Whooping Crane, Eskimo Curlew, and Western Prairie Fringed Orchid: Recommendations

The BLM should continue to identify any proposed project that may cause a depletion within the North Platte River system and should initiate formal consultation with the Service for each proposed project. Projects should not be implemented until after formal consultation has been completed.

BLM State Sensitive Species:

Greater Sage-Grouse:

The BLM should continue to use the seasonal restriction stipulation for breeding and nesting greater sage-grouse which prohibits construction and other activities from occurring between March 1 and June 30 of each year. In addition, the BLM should continue to use the seasonal restriction stipulation for greater sage-grouse winter habitat areas which prohibits construction and other activities from occurring between November 15 and April 30 of each year. The WGFD should continue to delay the opening date of the grouse hunting season to the middle of September, which should reduce hunter numbers and harvest. This delay reduces the vulnerability of grouse, particularly productive hens, by delaying harvest until after broods have broken up flocks and moved from the easily hunted riparian habitats into the more difficult open sagebrush (WGFD 2002d). Implement (or continue) management and projects to improve greater sage-grouse habitat, including nesting cover and species diversity and age class structure in upland and riparian habitat (particularly forbs). Continue monitoring habitat trends and grouse use where possible before and after projects have been implemented - for example, vegetative treatments and mineral development projects. Additional mitigation should be applied to projects, if required, and this mitigation should be monitored to determine the effects on the grouse.

Fisheries

1) Characterization

Regionally or Nationally Important Recreational Fisheries:

Miracle Mile

This tailwater fishery begins at the outlet of Seminole Reservoir and flows downstream into Pathfinder Reservoir. Hypolimnetic releases from Seminole Reservoir produce relatively constant water temperatures in the North Platte River at this site that have created a highly productive trout fishery for brown trout, rainbow trout, and cutthroat trout. The reputation of this fishery is known nationally and represents the single most publicized fishery in the analysis area.

Pathfinder and Seminole Reservoirs

Pathfinder and Seminole Reservoirs are a major feature of the Kendrick Project, providing water storage on the North Platte River for use in irrigation. These reservoir fisheries offers anglers the opportunity to catch walleye, rainbow trout, brown trout, and cutthroat trout.

Dune Ponds

These ponds, located in close proximity to Seminole Reservoir, once produced brown trout, rainbow trout, and brook trout of exceptional size, however, they do not presently sustain a fishery ([picture 94-1](#)).

Ferris Mountain Streams

The slopes of the Ferris Mountains contain several small streams, some of which harbor populations of coldwater and warmwater fishes. Pete Creek and Cherry Creek have both received prior management emphasis to increase their productivity as brook trout fisheries. Sand Creek, Muddy Creek, Whiskey Creek, Pole Canyon Creek, and Arkansas Creek also have existing or the potential to support small fishery populations. Their improvement as trout fisheries is contingent upon successful management of riparian vegetation and could benefit greatly from beaver activity.

Seminole Mountain Streams

Similar to Ferris Mountain, the Seminole Mountains are drained by several small streams that have existing fisheries or are thought to be able to support populations of trout. Deweese and Long Creeks are the largest streams with the most potential. Similar to the Ferris Mountain streams, their improvement as trout fisheries is contingent upon successful management of riparian vegetation and could benefit greatly from beaver activity.

Man-made Ponds

Bucklin Reservoir located north of Muddy Gap along Hwy 220 is stocked with game fish by the WGFD. A reservoir southwest of Bairoil is also stocked, with trout also moving up into Lost Soldier Creek. A&M reservoir west of Bairoil is having a new well developed next to it to ensure a reliable water source so fish stocking in this reservoir can resume([94-2](#)).

Native Fishes

Table 4. Fish species known to occur or potentially occurring in the analysis area.

Common Name	Scientific Name	Drainage	Source	Management Status
Bigmouth shiner	<i>Notropis dorsalis</i>	SW	Patton et al. (1998)	
Creek chub	<i>Semotilus atromaculatus</i>	SW	Patton et al. (1998)	
Fathead minnow	<i>Pimephales promelas</i>	SW	Patton et al. (1998)	
Longnose dace	<i>Rhinichthys cataractae</i>	SW	Patton et al. (1998)	
Sand shiner	<i>Notropis stramineus</i>	SW	Patton et al. (1998)	
Longnose sucker	<i>Catostomus catostomus</i>	SW	Patton et al. (1998)	
White sucker	<i>Catostomus commersoni</i>	SW	Patton et al. (1998)	
Iowa darter	<i>Etheostoma exile</i>	SW	Patton et al. (1998)	
Brook trout	<i>Salvelinus fontinalis</i>	ALL	WGFD	
Rainbow trout	<i>Oncorhynchus mykiss</i>	PS	WGFD	
Cutthroat trout	<i>Oncorhynchus clarki</i>	PS	WGFD	
Brown trout	<i>Salmo trutta</i>	PS	WGFD	
Walleye	<i>Stizostedion vitreum</i>	PS	WGFD	

SW = Sweetwater, PS = Pathfinder-Seminole, GD = Great Divide, ALL = Sweetwater, Pathfinder-Seminole and Great Divide.

Amphibians

The southern Rocky Mountain population of the boreal toad occupies forest habitats between roughly 7,500 and 12,000 feet elevation in Colorado, southeaster Wyoming, and north-central New Mexico. Throughout this range, boreal toads have been documented within lodgepole pine or spruce-fir forest types. Boreal toads have rarely been documented in lower-elevation ponderosa pine forests or willow and sage communities (BTRT, 2001). Distribution is thought to be limited by available breeding locations including large lakes, kettle ponds, man-made ponds, beaver ponds, marshes, and roadside ditches (BTRT, 2001). Adult toads have been shown to utilize upland habitats outside of the breeding season, showing an affinity for areas in close proximity to spring seeps.

Table 5. Special status Amphibian species known to occur or potentially occurring in the analysis area.

Common Name	Scientific Name	Drainage	Management Status
Boreal Toad	<i>Bufo boreas boreas</i>	SW, PS	BLM sensitive
Northern Leopard Frog	<i>Rana pipiens</i>	ALL	BLM sensitive
Great Basin Spadefoot	<i>Spea intermontanus</i>	ALL	

SW = Sweetwater, PS = Pathfinder-Seminole, GD = Great Divide, ALL = Sweetwater, Pathfinder-Seminole and Great Divide

2) Issues and Key Questions

Vegetation Management

The potential impacts of livestock grazing on stream processes and fish habitats has been well documented (Armour et al. 1991, White 1996, Rinne 1999). They include the loss of stabilizing riparian vegetation which can lead to stream instability and an associated loss of habitat complexity, the loss of shading vegetation which can lead to elevated stream temperatures, increased sediment delivery, and loss of stream channel complexity provided by fluvial processes and woody debris.

The importance of landscape-scale disturbances resulting from either wildfire or prescribed fires to aquatic species and riparian ecosystems has recently received additional attention (Bisson et al. 2003). Natural disturbance regimes maintain the diversity of riparian ecosystems (Naiman et al. 1993). These disturbances can include fire and fire-related flooding, debris flows and landslides (Dwire and Kauffman in press). Additional riparian influences result from the vegetative responses to fires outside the riparian zone. A key example of this influence is the regeneration of quaking aspen that can result from the top-killing of aspen during a fire. The regenerated aspen are then available for instream uses by beaver.

Beaver Habitat

Beaver activity can have several benefits to aquatic ecosystems including elevated water tables that enhance riparian vegetation, reduction of stream water velocities that reduce erosional forces, stabilization of stream flows throughout the summer and droughts, improvement of fish habitats, improvement of terrestrial wildlife habitats (Olsen and Hubert 1994). Beaver historically occupied portions of the analysis area, found mainly in areas containing healthy communities of willow or aspen. Signs of historic beaver activity are widespread on Ferris Mountain and Atlantic Rim. The beaver population around Atlantic Rim seems to be doing well due to both willow and aspen adjacent to Separation Creek. Several different colonies are scattered along the main stem and in numerous side channels. The loss of beaver from the Ferris' is thought to be due to the reduced distribution and vigor of woody vegetative communities as well as trapping of beaver for commercial uses and in areas where they are in conflict with agricultural practices such as irrigation ([picture 96-1, 96-2](#)).

Limited availability of aspen and willow in the majority of the analysis area is thought to currently limit the suitability of the area for beaver colonization. This loss of woody vegetation can be related to many causes including livestock grazing, herbicide spraying, conifer encroachment, fire suppression, and wildlife grazing. A negative feedback mechanism often exists between the loss of woody vegetation and the water table of riparian systems. As woody vegetation is lost, the stream channel can become unstable and begin to actively incise. As this incision proceeds, the water table can be lowered and result in a reduction in the amount and area of woody vegetation available for beaver use.

Energy Development

The influence of coalbed methane (CBM) production operations on fisheries can be divided into impacts resulting from surface discharge of produced waters, impacts on groundwater aquifers, and impacts resulting from surface disturbing activities. Two CBM projects are currently underway in the analysis area, the Seminole Road CBM Project and the Hanna Draw CBM Project. Additional CBM development projects are envisioned in the future in portions of the analysis area.

The impacts of surface discharge of produced waters on the habitats of fishes are variable. Both the quantity and quality of discharged waters can determine how fish habitats will be influenced. For example, the discharge of large volumes of water into ephemeral drainages can lead to stream channel adjustments such as incision that may simplify channel geometry and reduce the diversity of habitats required by each life stage of fishes (i.e. juvenile rearing habitat, spawning habitats, refuge habitats). If the discharged water is of poor quality, fish may be impacted either directly (e.g. increased water temperatures) or through the processes of bioaccumulation of metals. Fishes adapted to highly turbid rivers may be impacted by the discharge of waters with little turbidity. Additionally, decreasing the intermittence of flows may favor introduced fishes over native fishes that have evolved in the presence of a highly variable environment.

The impacts on surface water resources from groundwater extraction are also highly variable, depending on the connectivity of surface water resources to the target groundwater aquifer. If a connection occurs, there is potential to dewater both lentic and lotic systems that may be of importance to aquatic populations.

Road construction associated with CBM development can impact fish habitats by concentrating streamflow, which may cause stream channel adjustments, by adding sediment to the stream, or by fragmenting stream habitats at road crossings. Fragmentation of habitats has been shown to interfere with the metapopulation dynamics of many fish populations. When extirpations occur due to localized environmental variation, restrictions of fish passage eliminate the possibility of the area being recolonized from a neighboring population. Surface disturbing activities associated with well pad construction can increase sediment delivery to lotic and lentic systems which may interfere with the life history strategies of fishes. For example, clean gravels are required by some fishes for successful spawning. Increased sediment delivery can embed these gravels and render spawning efforts unsuccessful.

Conventional oil and gas development can also affect fish habitats. These impacts are largely associated with road construction and surface disturbing activities, similar to the impacts of coalbed methane development.

Transportation Planning

Roads can affect fish populations through fragmentation of habitats at road crossings, concentration of overland flow which can result in stream channel adjustments, and increased sediment delivery. Fragmentation of stream habitats can limit access to habitat features that are required by stream fishes. Stream fishes require habitats for spawning, rearing, feeding, and refuge from environmental extremes (Schlosser and Angermeier 1995). The spatial distribution of these required habitats can necessitate the seasonal movement of fishes among habitats. If barriers to movement are present, such as those caused by improperly designed road crossings, fish may not have access to all of the habitats necessary to fulfill their life history requirements. Additionally, barriers can interrupt metapopulation dynamics that allow for the recolonization of habitats that have experienced local extirpations.

Roads can also concentrate overland flow. This concentration of flow may generate greater water velocities that are foreign to the stream channel. The stream channel can, in turn, adjust to these increased velocities by changing its geometry through erosional processes such as channel incision.

Additional impacts of roads on fish communities are associated with increased sedimentation. The concentration of overland flow and increased rill and gully erosion associated with roads can affect required fish habitats. Increased sediment delivery to the stream can lead to the embedding of stream gravels. Some stream fishes require clean gravels for successful reproduction. Clean stream gravels are also necessary for the production of macroinvertebrates – a key food source for many stream fishes.

Invasive Species

On February 3, 1999, Executive Order 13112 on Invasive Species was signed. This order directed federal agencies to:

“use relevant programs and authorities to: (i) prevent the introduction of invasive species; (ii) detect and respond rapidly to and control populations of such species in a cost-effective and environmentally sound manner; (iii) monitor invasive species populations accurately and reliably; (iv) provide for restoration of native species and habitat conditions in ecosystems that have been invaded; (v) conduct research on invasive species and develop technologies to prevent introduction and provide for environmentally sound control of invasive species; and (vi) promote public education on invasive species and the means to address them...” as well as “...not authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.”

Introduced pathogens of concern in the analysis area include *Myxobolus cerebralis*, which can cause whirling disease in salmonid fishes, and Chytrid fungus, which can impact amphibian populations. Whirling disease is a parasitic infection that attacks the nerves and cartilage of small trout, reducing their ability to feed and avoid predators. These infections can significantly impact wild trout populations. Chytrid fungus has been cited as a cause of major declines in amphibian populations. The parasite responsible for causing whirling disease is known to occur at locations in the North Platte River drainage within the analysis area. Chytrid fungus attacks keratin of metamorphosed amphibians and can lead to 90-100% mortality in some species. The Boreal Toad Recovery Team (BTRT) has cited Chytrid fungus as a major concern in the southern Rocky Mountain population (BTRT, 2001). The occurrence of Chytrid fungus has not been documented in the analysis area. Both of these pathogens can be transported via contaminated waders or other equipment.

Invasive species of concern in the analysis area include zebra mussel and New Zealand mud snail. Zebra mussels have become widely distributed in the United States, particularly east of the 100th meridian. These exotic mussels have recently been discovered as near as Colorado, likely the result of overland transport by trailered boats. These mussels can be found in large lakes, ponds, and river systems throughout their range in the U.S. A major transport mechanism of these mussels is through attachment to boats and trailers. New Zealand mud snails appear to prefer

flowing water habitats with stable flows. Springs, spring creeks, and river sections downstream from dams are all places that they thrive in. They are most typically found on larger cobble substrates or on pieces of wood. These snails are known to occur in the Great Lakes region, as well as in isolated regions of the west, including Yellowstone National Park. New Zealand mud snails can be transported with fishing waders or other equipment that has been exposed to infected waters. The dispersal of these snails has been associated with recreational fisheries exhibiting high angler use. Neither the zebra mussel nor the New Zealand mud snail are currently known to occur in the analysis area and preventing their spread into this region will be particularly challenging.



Figure 1. Zebra mussel. Actual size is approximately $\frac{3}{4}$ inch.



Figure 2. New Zealand mud snail.

Nonnative fishes have been introduced and become naturalized in much of the analysis area (Table 1). Their impact on native fishes is not fully described in this area. As in other areas of the West, the use of desirable nonnative fishes for their recreational and aesthetic values will need to be balanced with the needs of native fishes. Emphasis should be placed on managing habitats for a diversity of fishes, including providing habitats for native and desirable nonnative fishes.

3) Current Conditions

Regional or Nationally Important Recreational Fisheries

Sampling of aquatic environments within the analysis has included both fish population and habitat sampling by the WGFD and macroinvertebrate sampling by the BLM.

Miracle Mile, Pathfinder and Seminole Reservoirs

Data unavailable at time of publication

Dune Ponds

Beginning in the mid-80s, the water level in these ponds began to drop, resulting in a gradual elimination of once exceptional trout fisheries. The specific cause of this declining water level is still a matter of debate. Potential causes proposed to date include the influence of declining water levels in Seminole Reservoir, the construction of a drainage ditch below the ponds, channel incision along feeder streams, and climatic influences. Further investigations are needed to define the cause of the observed drop in water levels in these ponds.

Ferris Mountain Streams

The WGFD conducted fish populations sampling in this area during the 2002 field season. In addition to brook trout, Pete Creek contains longnose dace and white suckers. Miner's Canyon Creek and Sand Creek contain populations of brook trout. Both Whiskey Creek and Arkansas Creek appear to have some potential to support populations of coldwater game fish, but the WGFD found there to be no fish present at the time of sampling in 2002.

Seminole Mountain Streams

Sampling by the WGFD in 2002 found only Deweese Creek and Long Creek to currently support trout populations, with Deweese Creek containing a small population of brown trout, and Long Creek containing a population of brook trout. No warmwater fishes were found during this sampling effort. Several additional streams are thought to have some potential to support trout populations in this area. These include Junk Creek, Sunday Morning Creek, Tin Cup Creek, and Wood Creek.

Man-made Ponds

These ponds are restocked as needed, usually every two or three years. The pond southwest of Bairoil is the only site that presently has fish in it.

Native Fishes

The distribution and status of native fishes within the analysis area is currently unknown.

Amphibians

The distribution of the southern Rocky Mountain population of boreal toad has witnessed dramatic reductions in its range (BTRT, 2001). Inventories for boreal toad have not been conducted within the analysis area (See Standard 4 – Wildlife and Threatened/Endangered Species).

4) Reference Conditions

References to historical stream conditions are limited. See Standards 2 and 5 for historical accounts of stream habitat conditions. Distributional changes of native fishes east of the Continental Divide were recently assessed by Patton et al. (1998). No trout species are native to the analysis area.

5) Synthesis and Interpretation

The analysis area contains many unique aquatic resources. These include notable recreational fisheries such as the Miracle Mile and Pathfinder and Seminole Reservoirs. The importance of these fisheries to the local economy and to the quality of life of the citizens of the area is significant. Although BLM is not involved in reservoir and fishery management, managing adjacent upland habitat to minimize runoff and soil erosion into these sites is our responsibility. Several other waters have the potential to provide quality recreational opportunities.

The descriptions for Standard 2, Riparian/Wetland Health, also applies in most cases to fisheries. Livestock grazing is the principle factor affecting fisheries habitat. Changing the season of use and/or shortening the duration of use are the best methods for improving riparian habitat for fish. As streams improve in vegetative health, water flows improve and temperatures are kept lower. The second factor needing attention is the lack of beaver and the habitat to support them. Beaver also improve water retention and lower temperatures due to their dams and ponds.

Baseline inventory information is lacking for native species of fish and wildlife throughout much of the analysis area. Though some broad-scale inventories have been conducted to identify trends in populations of native fishes in Wyoming, site-specific information required for effective land management is presently lacking.

Given an insufficient temporal perspective, macroinvertebrate samples from Pete and Cherry Creeks will not be used to make a one-time assessment of stream health or function. Rather, continued sampling will be useful to monitor the effectiveness of land management activities and progress of riparian restoration for these two streams.

6) Recommendations

The improved management of riparian habitats through the use of grazing BMPs indicate both an upward trend and meeting Standard #4 for fisheries for some of the streams in the assessment area. However, many other sites that should support fisheries, currently do not. Standard #4 for fisheries is not being met on streams, which currently fail Standard #2 – Riparian/Wetland Health. There are also sites that are rated in proper functioning condition, but due to the lack of overhead cover (stream shading) exceed temperature requirements for some fish species and won't support them. However, these sites have not yet been defined. Due to the lack of credible data on the status of native fishes in the watershed, whether Standard #4 is being met for these species is unknown.

Completing inventories for native fishes and native amphibians, including boreal toad, should be a high priority for the fisheries program in coming years in order to identify site-specific land management opportunities.

Vegetation Management

In areas not meeting Standard 2, implement allotment management plans that will provide the amount of vegetation necessary to ensure adequate watershed protection under grazing use to perpetuate vegetation, enhance woody plant vigor, and assure soil stability. In allotments containing portions of the Miracle Mile, implement grazing management strategies that reflect the importance of this fishery both locally and nationally. Implement treatments including prescribed fires, in conjunction with grazing management, within forested areas that increase the regeneration of aspen stands.

Energy Development

Consideration of the viability of aquatic populations will be an important component of effective land use planning for energy development activities. These considerations should include obtaining baseline inventory information in proposed development areas, considering life history requirements of native species when designing transportation networks, and maintaining the integrity and diversity of stream and wetland habitats.

Transportation Planning

Designing road crossings that simulate natural stream processes would allow for the passage of aquatic organisms and allow access to habitats required by stream fishes. This can be accomplished by using a number of designs including bridges, bottomless culverts, and baffled culverts. Several references are available to help in this design process. Road designs should also consider appropriate energy dissipation in order to limit the concentration of overland flows and resulting sedimentation.

Invasive Species

Avoiding the transportation of invasive species to new habitats should be considered a high priority for the Rawlins Field Office. As the distribution of invasive species is not fully known, disinfecting equipment and materials that have been used in riparian or wetland environments should be considered standard precautions. All programs should use the chlorine bath maintained by the fisheries crew for disinfecting their equipment and materials before they are used in a new location. Instructional Memorandum No. WY-030-99-007 outlines required disinfection procedures for the Rawlins Field Office.

Weeds

1) Characterization:

Weeds, invasive non-native plants, ecologically threaten natural ecosystems and greatly impact natural plant communities throughout the West. The reduction of light, water, nutrients, and space available to native species can change the hydrological patterns, soil chemistry, erodibility, and may even change fire patterns on a localized basis (NPS ref). These invaders can reduce biodiversity, affect threatened and endangered species, change habitats and natural plant/animal associations, and prevent native species from remaining or encroaching upon a site. Weed infestations reduce forage availability for livestock and wildlife. Unlike many areas of the West, the Rawlins Field Office has a comparatively smaller weed problem than other areas in the Rocky Mountain region. The analysis area is relatively noxious weed free, with just small problem areas. The term *noxious* is a legal designation used specifically for plant species that have been determined to be a major threat to agricultural and/or natural ecosystems and are subject, by law, to certain restrictions. Invasive species include those that increase and invade disturbed areas and may or may not be able to invade native rangeland. Within the analysis area, noxious and invasive species are predominantly found along roadways and other disturbed areas associated with oil and gas development, recreational use, and livestock grazing activities. Road building, development, grazing, fire suppression, recreation, and other activities can directly increase weed establishment, introduction, and/or maintain their presence within the ecosystem.

The main noxious species present within the area are Dalmatian toadflax, spotted knapweed, Russian knapweed, and whitetop. Other noxious species include saltcedar, perennial pepperweed, Canada thistle, diffuse knapweed, and leafy spurge. There are also several invasive species present which are normally restricted to disturbed areas. These include halogeton, Russian thistle, begonia dock, henbane, gumweed, annual goosefoot, cheatgrass, cactus, and several annual mustards. Most invasive species are not treated unless they are interfering with reclamation of disturbances, or are a fire hazard around well locations.

2) Issues and Key Questions:

As new disturbances are continually being created, the area is seeing an expansion of some of these species. Current issues in the assessment area follow:

- Noxious weeds and invasive species are spreading into undisturbed rangeland from the initial sites of introduction along many roadsides, well pads, pipelines, livestock water developments, hunter camps, and other disturbed areas.
- Adequate mitigation measures are in place to address weed control on disturbed areas, however, enforcement of existing stipulations is spotty.
- The Bureau of Reclamation (BOR) is not conducting any weed treatments on lands withdrawn from the BLM.
- Some private landowners adjacent to BLM land have yet to implement noxious weed management programs, thereby negating some of the potential effectiveness of treatments on BLM lands.
- More direct action is needed in allotments where livestock movements are increasing weed presence.
- Historic high populations of wild horses, combined with ongoing conversions from sheep to cattle grazing have affected the condition of native rangelands, making them more susceptible to invasion by weed species.

- Where recreation is a factor in weed establishment and spread, measures frequently are not being taken to address this issue.
- There are no reasonable measures available to control wildlife movements that spread weeds.

3) Current Conditions:

Weed locations are primarily restricted to disturbed areas associated with oil and gas development, recreational use, and livestock grazing activities such as water developments. Some noxious weed locations associated with manmade disturbances are being treated either by lease/ROW holders, County Weed and Pest personnel, or the BLM. There are only a few areas where the noxious weeds are spread throughout native rangeland. Some of these areas are being treated to contain the weeds where they are. A goal is to avoid having them spread elsewhere by vehicle, equipment, or animal movements. Most Federal, State, and county improved roads are being treated for weeds. Some Oil and gas related disturbances, and most recreation areas (land administered by the BLM), are being treated for weeds and are the main source of weed introduction and spread. Continued oil and gas activity will result in the expansion of some of these species as development-related disturbance continues.

As stated earlier, the principle noxious species found within the analysis area include Dalmatian toadflax, spotted knapweed, Russian knapweed, and whitetop. The following weed descriptions and associated photographs were taken from *Weeds of the West*, the authorization for which is in Appendix E, and *Biology and Management of Noxious Rangeland Weed*.

Dalmatian toadflax is a mildly poisonous perennial up to three feet tall, which reproduces by seed and underground root stalks. It is very aggressive, with a deep root system and a waxy leaf, which render it very difficult to eradicate. It usually prefers well-drained, relatively coarse-textured soils with low precipitation or soil disturbance. Toadflax can establish in naturally occurring disturbances or small openings in pristine areas and on rangeland in excellent condition. Once growth begins, condition of the rangeland does little to slow expansion of the infestation.

Dalmatian toadflax occurs in two areas. One area is north of Rawlins (on private land abutting BLM) along Highway 287, which is being treated, but is still expanding. Ten acres here fail to meet the standard. The other is by Seminoe Reservoir on BLM lands, and withdrawn BLM lands managed by the BOR, which has had no chemical treatment. The University of Wyoming has released some biological control agents on an experimental basis in this area. The toadflax is rapidly expanding ([picture 104-1](#)). Five acres here are at risk of infestation, but still meet the standard currently. There are small spot infestations starting along the roads, from vehicles spreading the seed, and in undisturbed rangeland from animals redistributing seed.

Spotted knapweed is usually a biennial or short-lived perennial, one to three feet tall, reproducing by seeds. It grows early and is highly competitive. It usually starts in disturbed areas, and can readily spread into well-managed native vegetation. Sites dominated are subject to increased runoff rates (up to 60%) and stream sediment yield increases (up to 200%) compared to bunchgrass sites (Lacey et al 1989).

Spotted knapweed occurs above Seminoe and Kortes Reservoirs on BLM land, and withdrawn BLM lands managed by the BOR, and have had mechanical and some chemical treatment. It was introduced by construction of a high-voltage power line and is being spread mostly by vehicles

along roads in the area. It has also been found along the main road through the area in one spot (so far), which is being treated.

Russian knapweed is a poisonous perennial, which forms dense colonies. It is a native of Eurasia and is found throughout the West. It spreads by seeds and adventitious roots that can penetrate up to eight feet, it is allelopathic, and is toxic to horses.

Russian knapweed is found in many places throughout the assessment area. Hay Reservoir has a rather large infested area of about 1400 acres, which is spreading slowly, and not being treated as of yet ([picture 105-1](#)). There are nearly 100 acres on the southwest side of the Ferris Mountains, that is also expanding, and has received only limited treatment. There are several small, and one medium sized patch, north of Wamsutter and the Continental Divide exits along the oil and gas roads. These areas are being treated. A larger area in Bell Springs allotment, not presently being treated, is expanding, partly in response to a recent gravel pit and road. Eighty acres here are not meeting the standard. There are scattered small patches around Muddy Gap, which are being treated as found. There are also small areas all along the Seminoe Road, which are being treated with the exception of the Morgan Creek Drainage. The area along Miracle mile, upstream and down, is infested. It occurs below Kortes Reservoir on BLM land, and withdrawn BLM lands managed by the BOR, and is not being treated. This puts approximately 40 acres currently at risk from invasion. Total acres not meeting this standard are 1600.

Whitetop (hoary cress) is a deep-rooted perennial up to two feet tall, which reproduces from root segments and seeds. It occurs on alkaline, disturbed soils along roads and the edge of meadows and irrigation ditches, and is highly competitive with other species. It can be mildly toxic to cattle and is one of the more difficult to control weeds. Whitetop occurs along roads and other disturbed areas throughout the analysis area. Most areas are not treated.

Other noxious species present in the analysis area are:

Saltcedar is a deciduous shrub introduced from Eurasia as an ornamental. In many places it has become naturalized along streams and reservoirs and tends to form monocultures that limit biodiversity. Saltcedar can transpire up to 200 gallons of water per plant each day and can dry up ponds and streams. In addition, they bring large amounts of salt up from the soil and deposit it on the surface, thus rendering adjacent sites uninhabitable by native species. This shrub is difficult and expensive to control. It occurs in some borrow areas along the Interstate (five acres fail the standard) and isolated patches scattered throughout the analysis area. Isolated patches are treated as found. It also occurs all around Seminoe and Pathfinder Reservoirs on withdrawn BLM properties managed by the BOR, none of which is being treated. It has increased tremendously in these areas since the drought and associated low reservoir levels. Sites found along Hay Reservoir are mixed in with Russian knapweed, with acres failing this standard included in the acreage already listed for the knapweed.

Canada thistle occurs in and along riparian habitat, and in some cases along roads where runoff water accumulates. As long as the riparian habitat is being properly managed, Canada thistle is not expanding and occupies the niche between the riparian and upland habitats. Canada thistle occurs basically throughout the assessment area and is treated along most main roads.

Diffuse knapweed is an annual or short-lived perennial, up to three feet tall. It grows along roadsides, disturbed areas, and dry rangelands, especially liking bitterbrush/bunchgrass communities on light, well-drained soils. Diffuse knapweed occurs above Seminoe and Kortes Reservoirs on BLM lands, and BOR withdrawn lands, and has had mechanical and some

chemical treatment. It was introduced by construction of a high-voltage power line and is being spread mostly by vehicles along roads in the area.

Leafy Spurge is a perennial, up to three feet tall, which grows basically anywhere. It is highly competitive and extremely difficult to manage ([picture 106-1](#)). Spurge contains milky latex, an irritant that causes lesions around the mouth and eyes of cattle when ingested. Spurge is known to occur in the Muddy Gap area and is being treated as found. Wildlife appear to spread the spurge the most and are carrying it up and around the Wilderness Study Area. This is observed along draws and shrub patches in small amounts of an acre or less in size. Altogether there are an estimated 700 acres of leafy spurge scattered across 3,000 acres on the southwest side of the Ferris Mountains that do not meet this standard, most of which is not being treated.

The invasive species of concern are halogeton, black henbane, gumweed, and cheatgrass. Other invasive species include begonia dock, annual goosefoot, Russian thistle, cactus, and several annual mustards. Halogeton is widespread throughout the oil and gas areas, lining roadways and in some cases dominating inadequately reclaimed sites ([picture 106-2](#)). It is also invading into nearby native rangelands on shale and saline upland sites from untreated oil and gas roads. Halogeton is poisonous and has caused sheep losses (as recently as January, 2003) due to its prevalence in certain areas. Since the sheep numbers have declined, fewer losses due to halogeton poisoning have occurred. It often provides lush forage along roads due to the late summer flowering habit and added moisture from road runoff. Halogeton has also been known to kill cattle. Although it is a stipulation on oil and gas APDs (Applications for Permit to Drill) and ROWs (Right of Ways) to treat and control weed species, in many cases this is not occurring. Black henbane is also poisonous and can expand rapidly in disturbed areas, so it is targeted for treatment, primarily along disturbed roads. Gumweed is native but excels in disturbed areas, especially during dry times. It can form nearly pure stands along roadsides and is unpalatable forage for all animals. Cheatgrass occurs sporadically throughout the assessment area. Disturbed areas along roads, corrals and salt blocks are common locations. However, it can also be found on rangelands on well-drained, disturbed soils, particularly on south and west facing slopes. Cactus occurs in a few places which have received historic spring use or overuse. Annual mustards, goosefoot, Russian thistle, and begonia dock occur along disturbed roadsides throughout the area. These generally are not large-scale problems, but patchy ones. Most invasive species, including halogeton, are not treated unless they are interfering with reclamation of disturbances or are a fire hazard around well locations.

4) Reference Conditions:

“Early European settlers in North America inadvertently brought weed seeds with them, perhaps in the hay they brought for their animals or in the dirt they used as ballast for their ships, or even in their clothes or bedding. Some activities, such as clearing the land, opened up niches that created places for weeds to grow. Settlers also purposely brought plants from their ‘home country’ to reseed areas, make dye for clothing and use as ornamental plants. Some of these non-native plants became invasive, reducing the diversity and quantity of native plants. Weeds are continuing to spread rapidly in many areas across the country. Weeds spread to an estimated 4,000 acres each day on public lands managed by the BLM and Forest Service” (BLM Noxious Weed Webpage).

For the most part, this assessment area has been weed-free until relatively recent disturbances by man over the past 50 or 60 years. Petroleum development, especially in the western portion, has greatly increased noxious and invasive non-native species introduction. The advent of motorized travel and subsequent increasing miles of road have resulted in the spread of weedy species.

Settlers along riparian corridors have historically impacted these areas by clearing the land, irrigation, and overall human presence-associated disturbances. These areas also tended to have higher concentrations of livestock, especially historically, when riparian systems were “sacrifice areas” and did not receive the management attention that they receive today.

5) Syntheses and Interpretation:

The highest priorities for treatment are the aggressive noxious weed species, such as the knapweeds, musk thistle, toadflax, saltcedar, and leafy spurge, which are able to spread throughout stable native plant communities. These are promptly treated and monitored, and are not specifically related to livestock grazing. Where livestock grazing is contributing to the invasion or expansion of weed species, management must be adjusted.

Due to the BLM’s multiple use philosophy, oil and gas development will continue to occur, providing increased disturbance areas for additional weed establishment. Mitigation practices to control these weeds will continue to be necessary. In addition, the presence of roads and their associated maintenance will also continue to provide additional infestation sites. Some annual weed species are initially beneficial in terms of providing cover on reclaimed pads and pipelines that trap snow, reduce runoff, and shade young perennial grasses. However, these species should not continue to be the dominant species several years after reclamation has occurred.

A significant portion of the watershed has not been inventoried for weeds, but it is generally assumed that unless there are disturbances, there probably are not any weedy species present. The exceptions are where noxious weeds are already established in an area, and buffer zone inventories around the patches are not complete. Most invasive species are not treated unless they are interfering with reclamation of disturbance. As native vegetation is reestablished, many of the invasive species will be crowded out. The species of long-term concern within the assessment area are the noxious species and halogeton.

6) Recommendations:

Due to the existing good condition of native vegetation and the weed treatment program in place to control and/or eradicate identified weed problem areas, it is determined that the majority of the watershed is meeting Standard #4 with respect to weeds. There are known areas of noxious weeds that are rapidly expanding and are not being treated. These areas affect approximately 2400 acres. The following recommendations, in addition to following the Rawlins Weed Prevention Plan (BLM, 1999), would expand upon the success already achieved and help to meet desired resource conditions in the future.

Continue inventory and treatment efforts in the area to identify and contain or eradicate noxious weeds. Continue to work with ROW/lease holders in their treatment of weedy species, as well as work with landowners on concurrent treatments with private lands. Enforcement of stipulations on APDs/ROWs to control weeds must occur.

Re-initiate contact with BOR personnel to encourage weed treatment on BOR withdrawn lands, especially where the weeds are putting BLM managed lands at direct risk of invasion.

Identify all weed species that need to be treated throughout the assessment area. Although some may not be a major focus for treatment, they can be a significant problem within localized areas.